



FIG. 1(a)

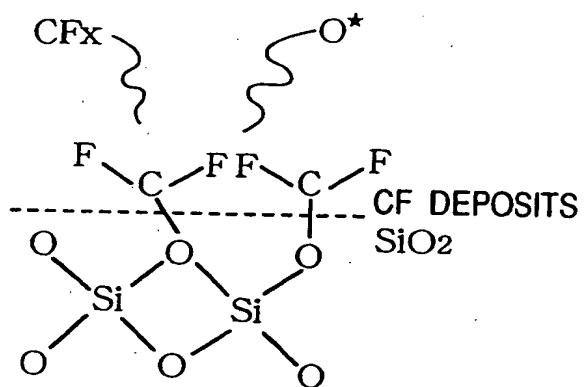


FIG. 1(b)

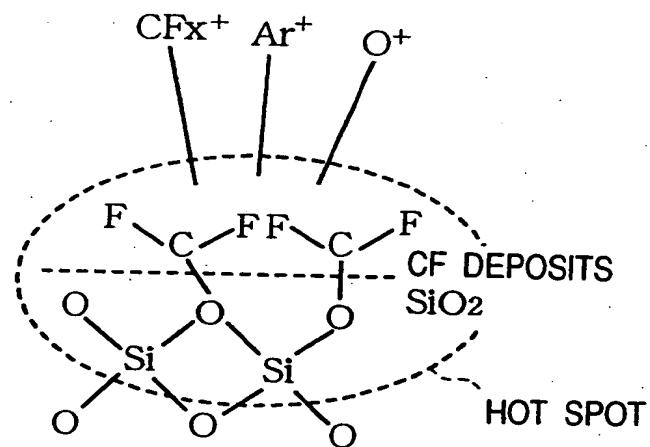


FIG. 1(c)

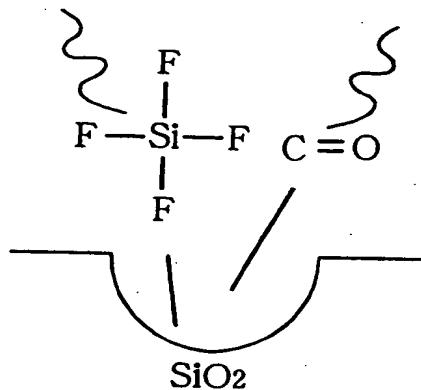


FIG. 2(a)

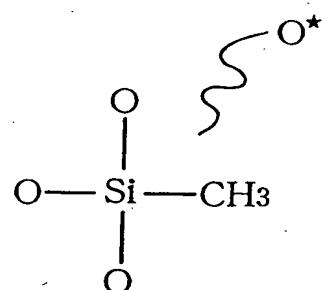


FIG. 2(b)

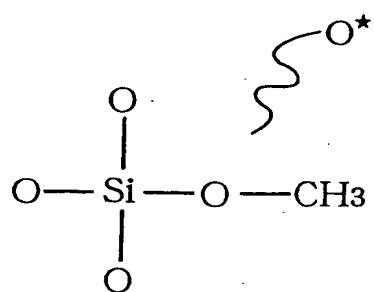


FIG. 2(c)

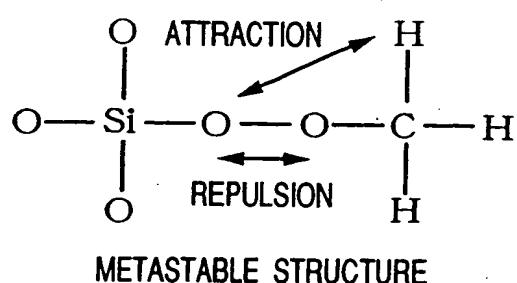


FIG. 2(d)

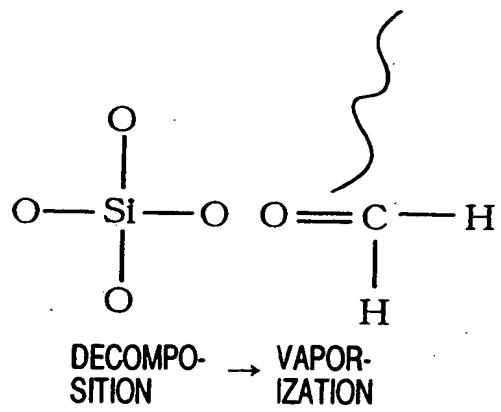


FIG. 3(a)

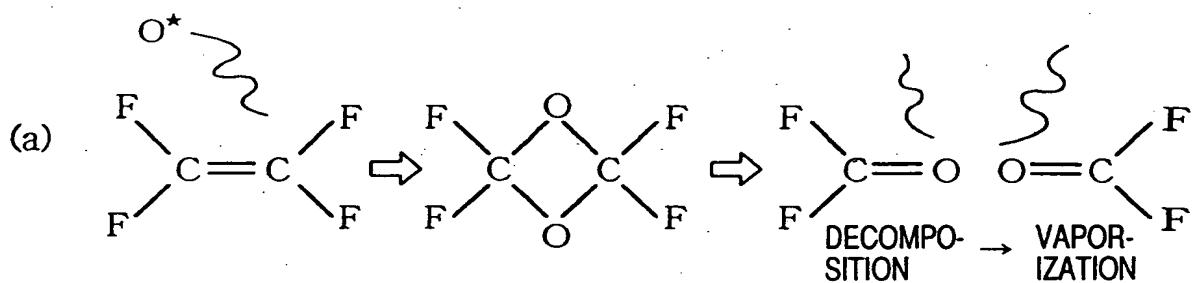


FIG. 3(b)

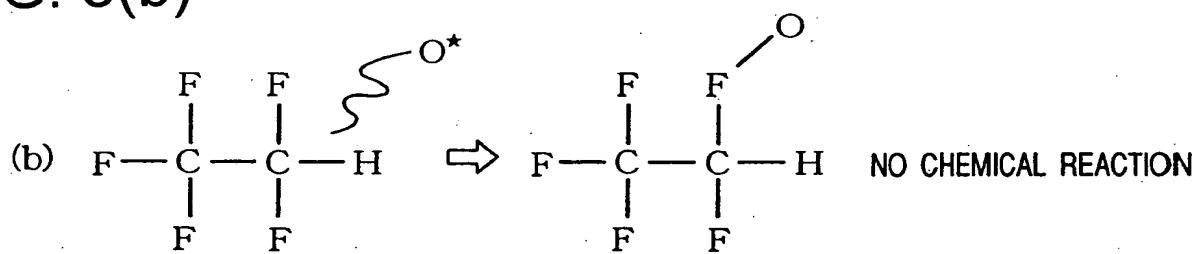
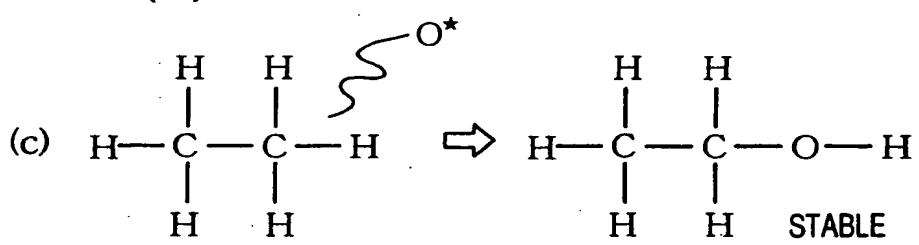


FIG. 3(c)



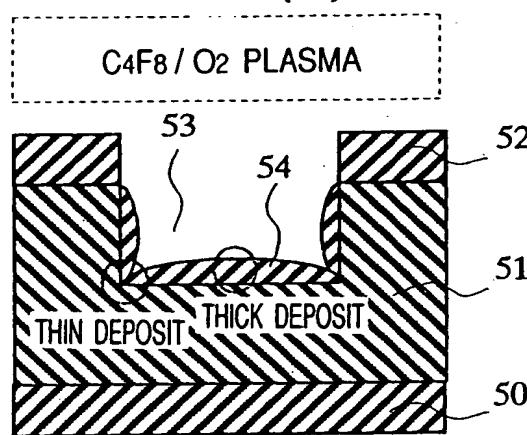
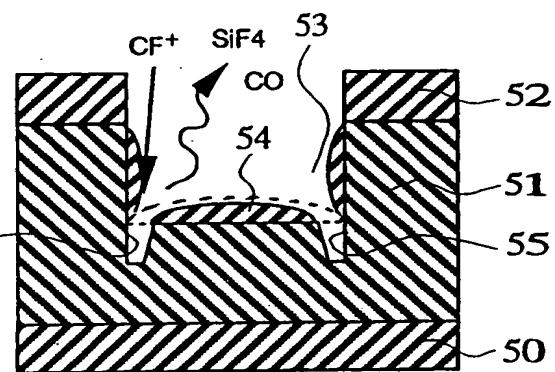
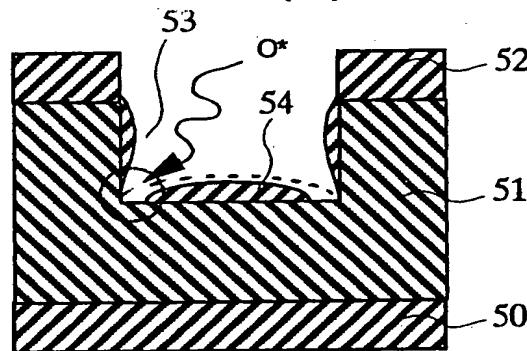
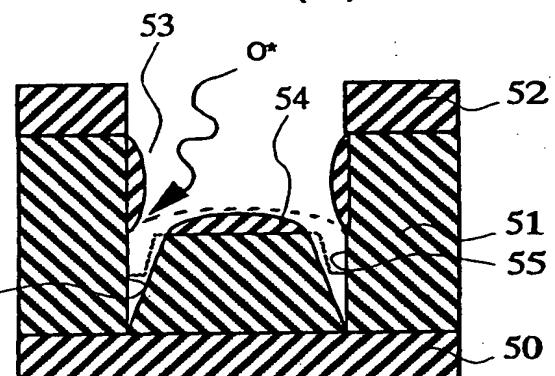
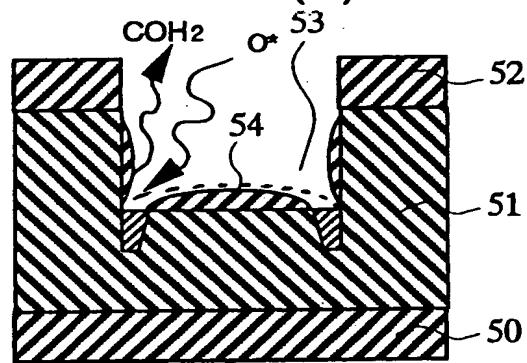
**FIG. 4(a)****FIG. 4(d)****FIG. 4(b)****FIG. 4(e)****FIG. 4(c)**

FIG. 5(a)

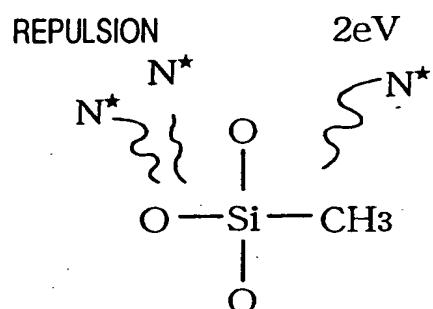


FIG. 5(b)

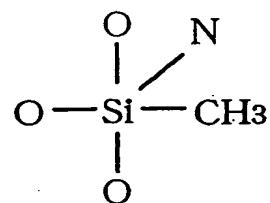


FIG. 5(c)

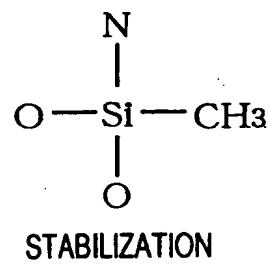


FIG. 6(a)

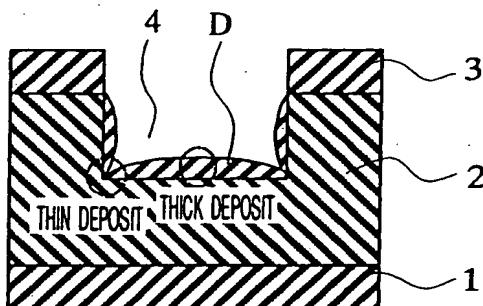
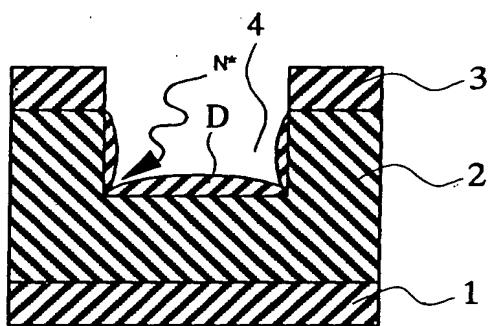


FIG. 6(b)



1: INSULATING FILM  
2: ORGANIC INSULATING FILM  
3: PHOTORESIST FILM  
4: RECESS

FIG. 6(c)

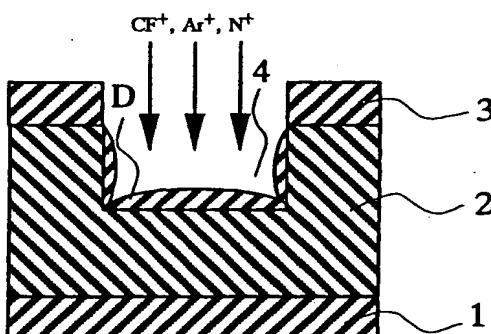


FIG. 6(d)

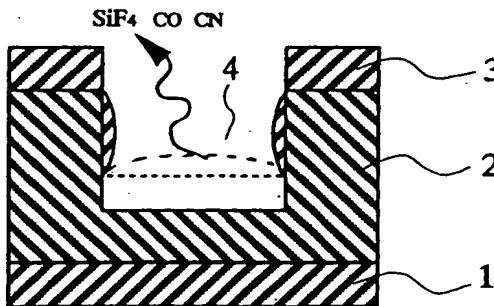


FIG. 7

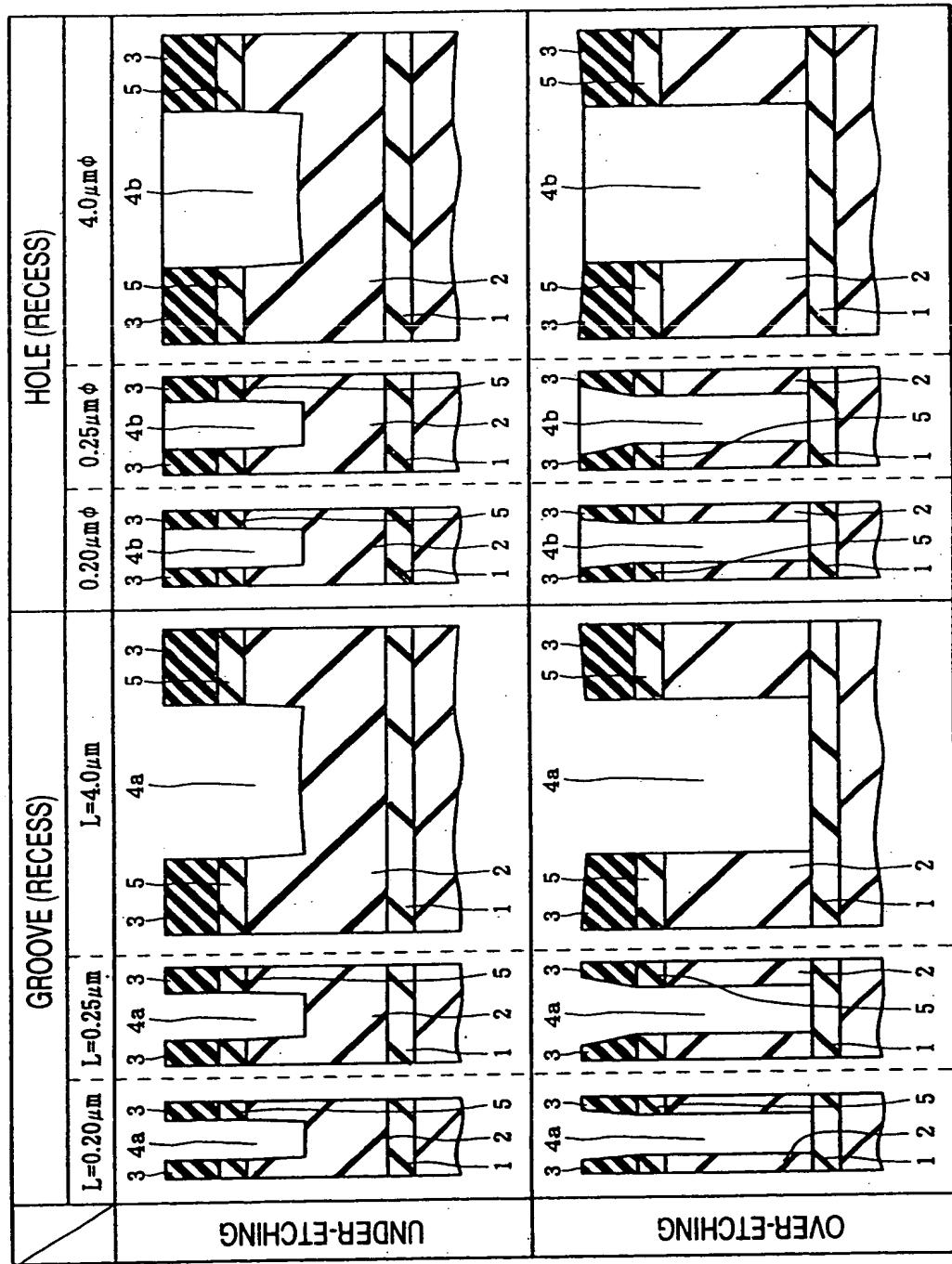
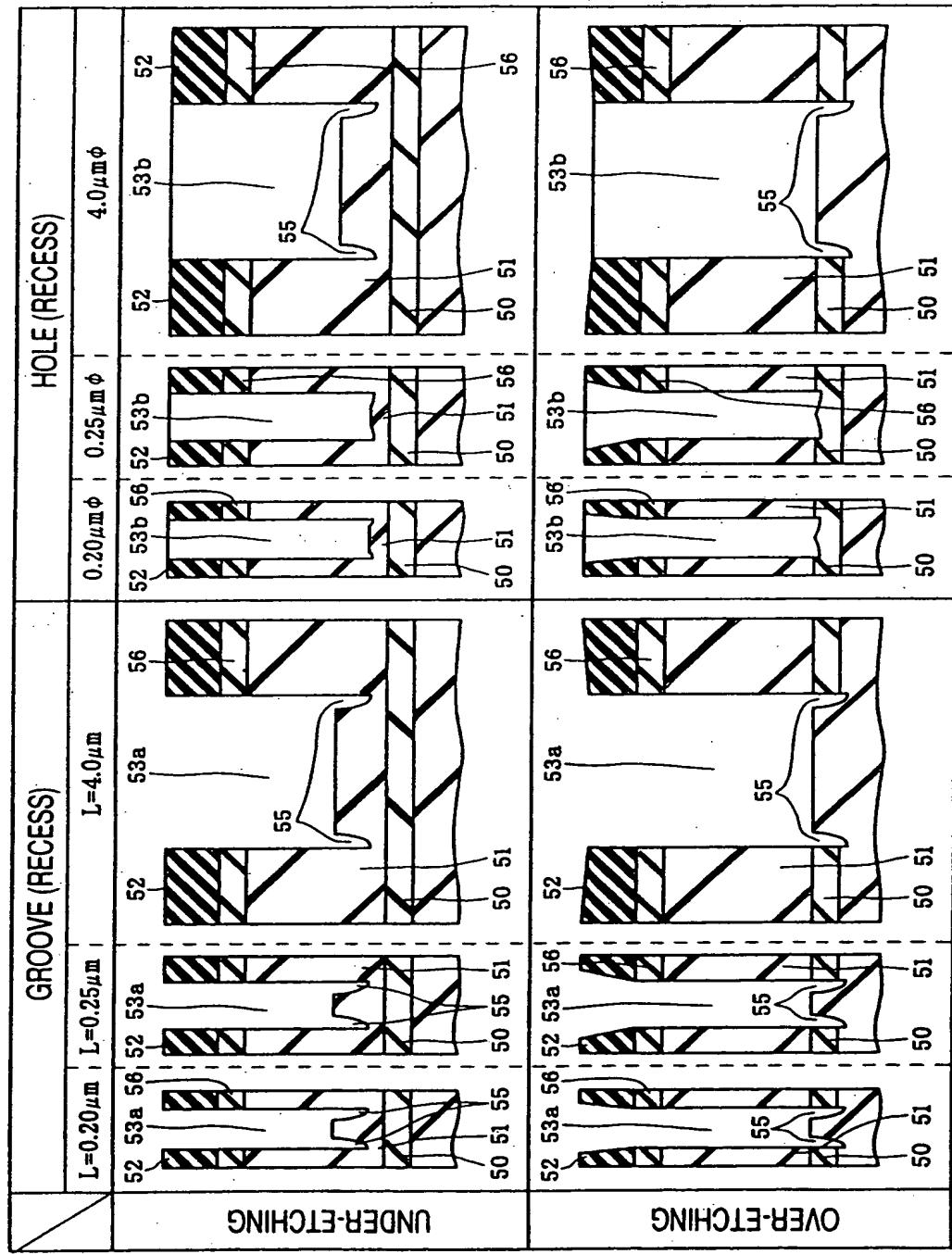


FIG. 8



9 / 85

FIG. 9

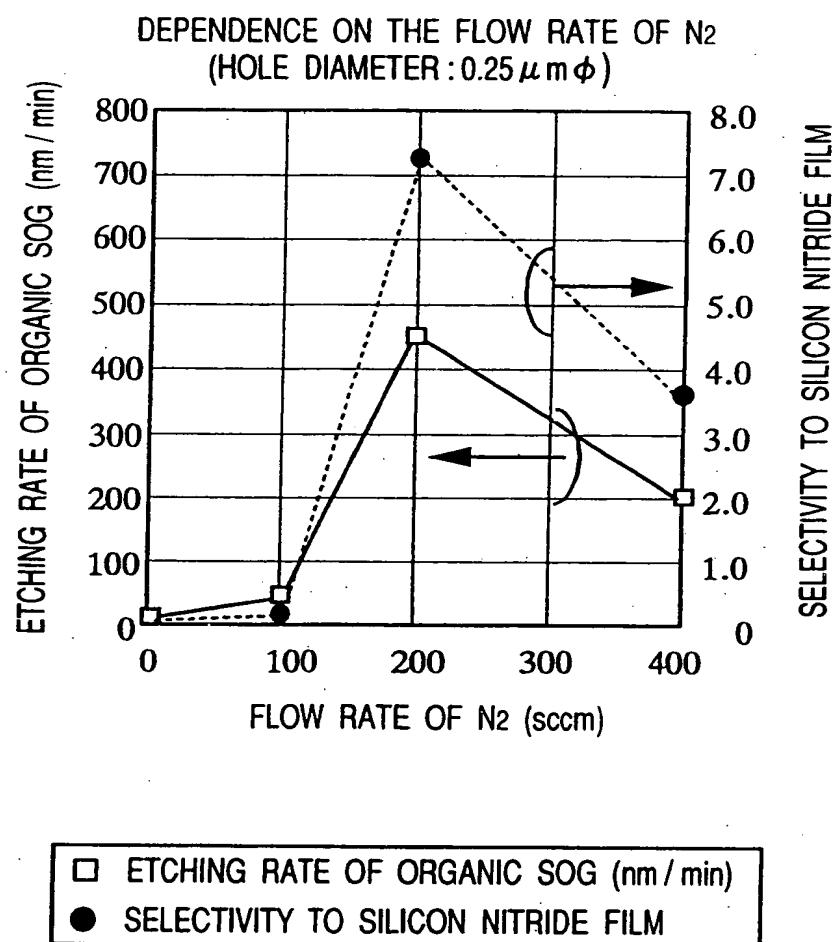
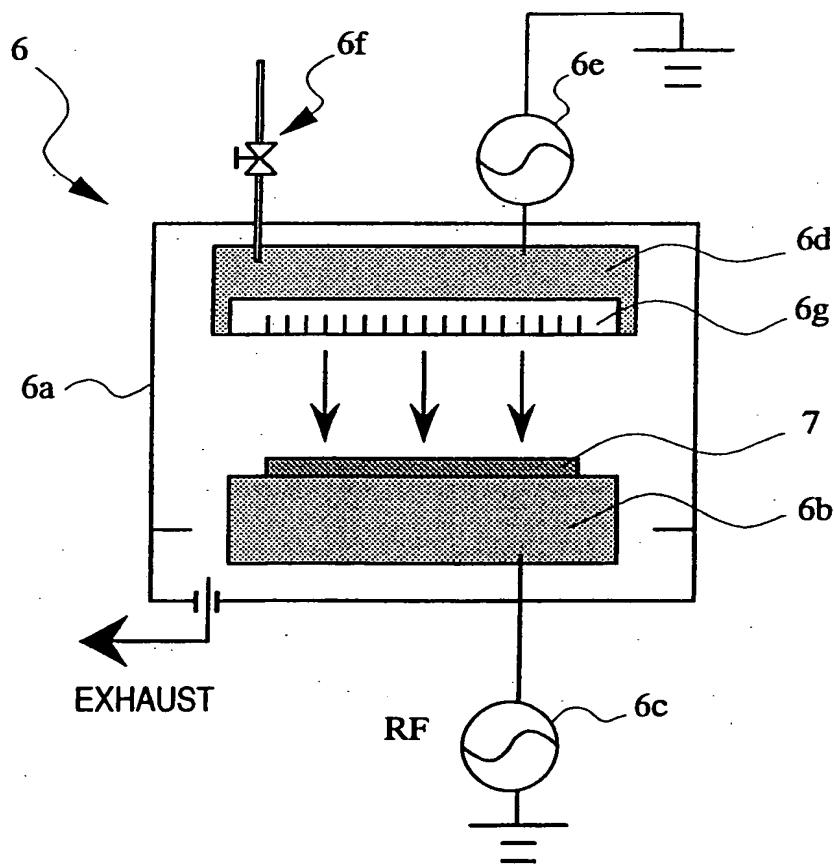


FIG. 10

	CF GAS ALONE	CF GAS / CO <sub>2</sub>	CF GAS / N <sub>2</sub>
ETCHING RATE	×	○	○
SELECTIVITY	×	○	×
FORM	△	×	○
ELIMINATION PROPERTY	×		○
SYNTHETIC EVALUATION	×		△

11 / 85

FIG. 11



12 / 85

FIG. 12

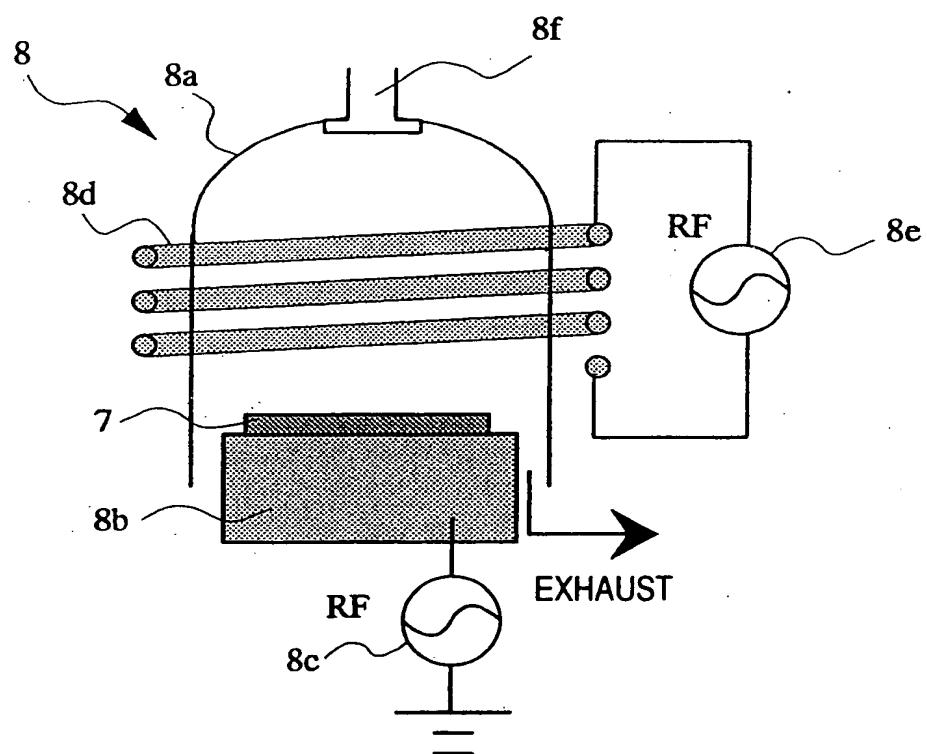


FIG. 13

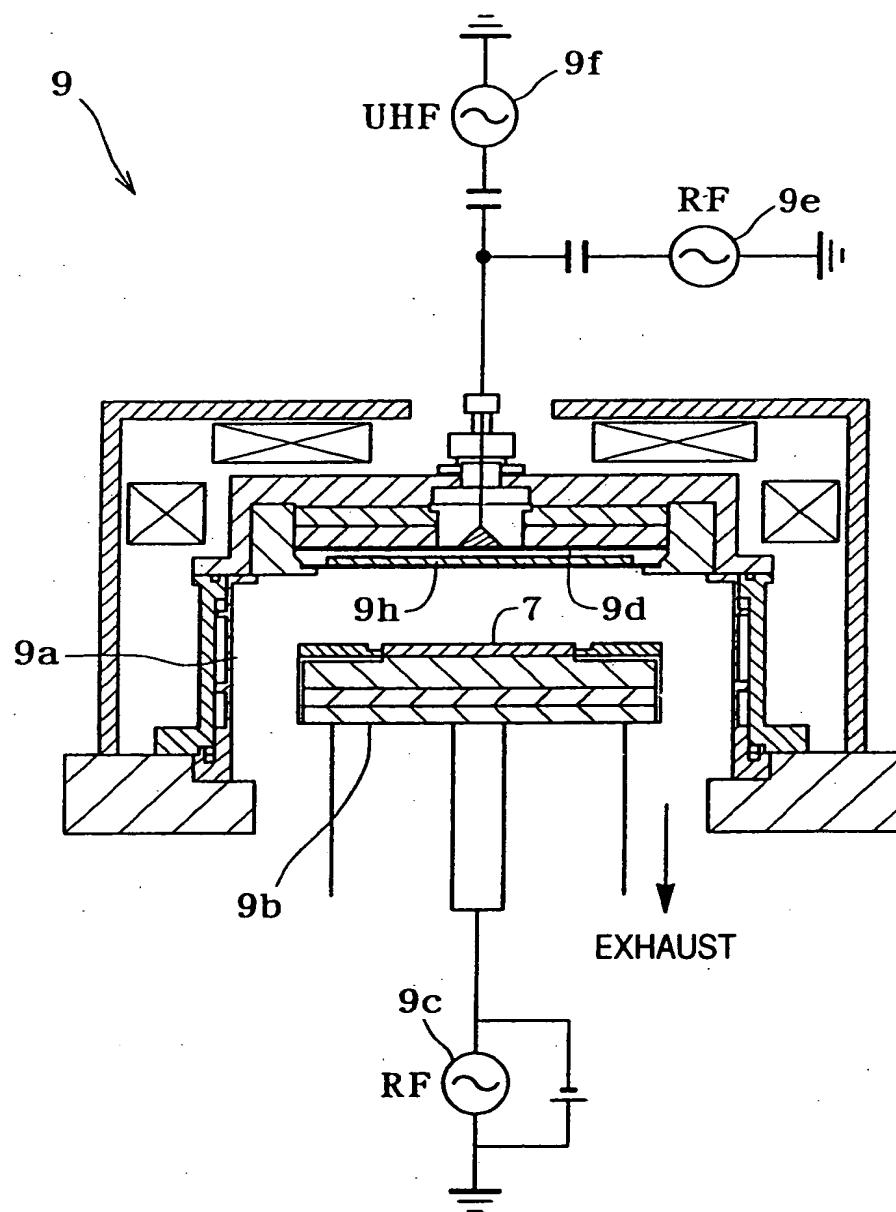


FIG. 14

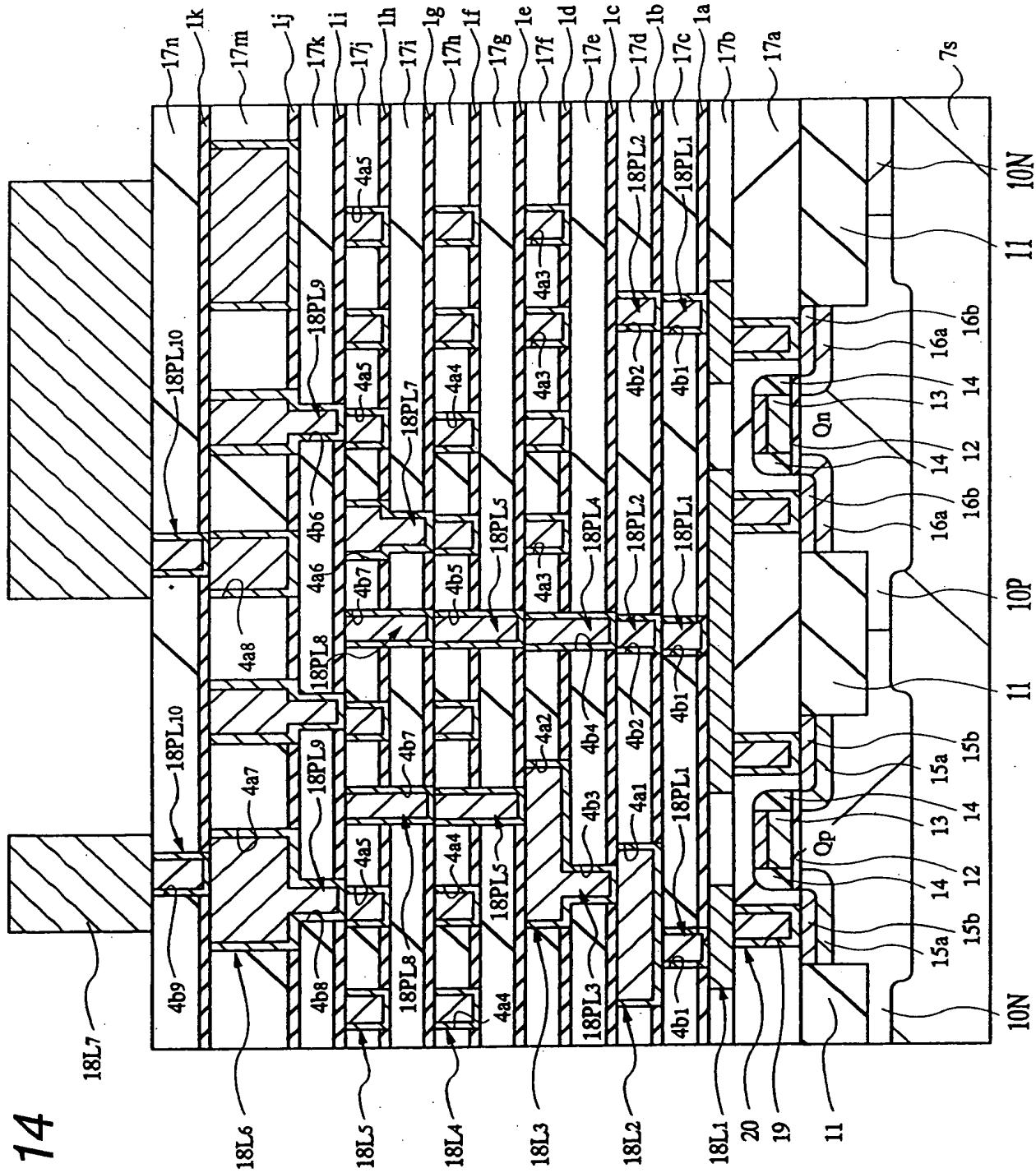


FIG. 15(a)

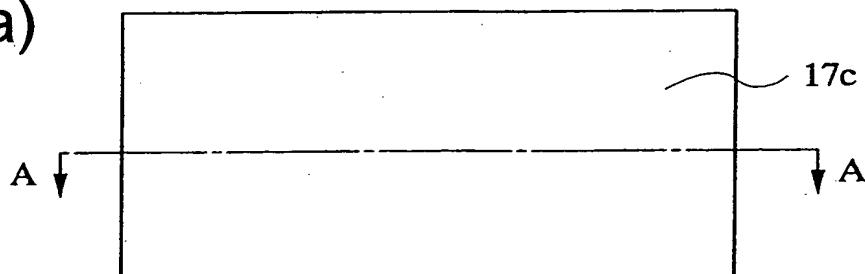


FIG. 15(b)

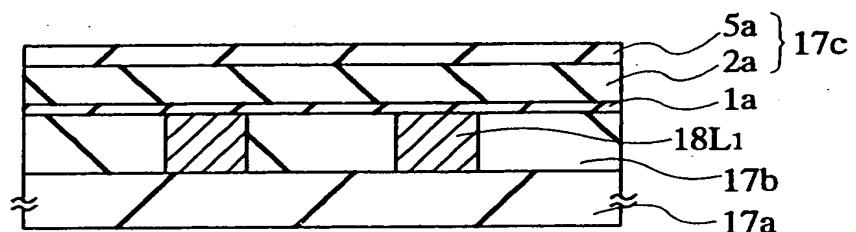


FIG. 16(a)

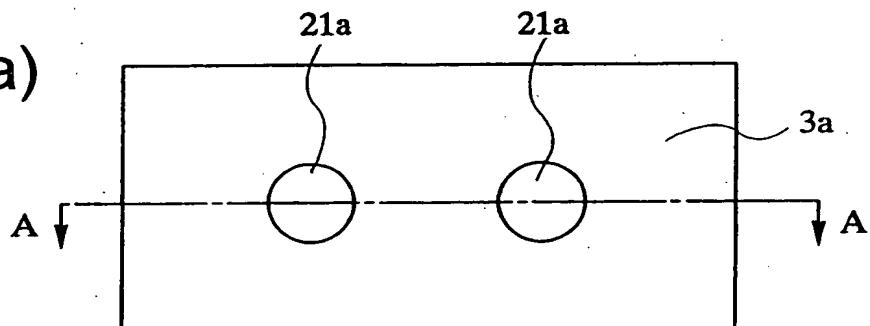


FIG. 16(b)

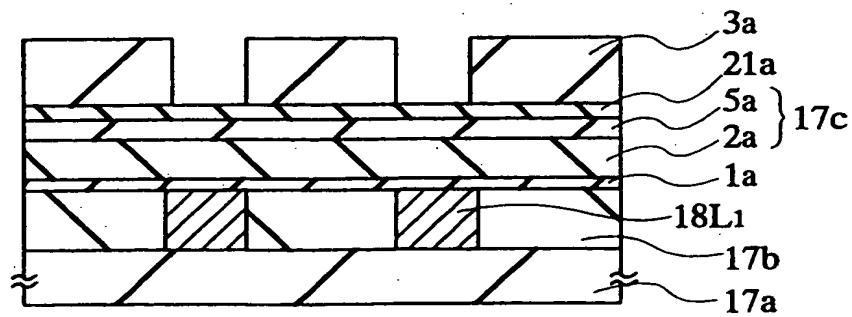


FIG. 17(a)

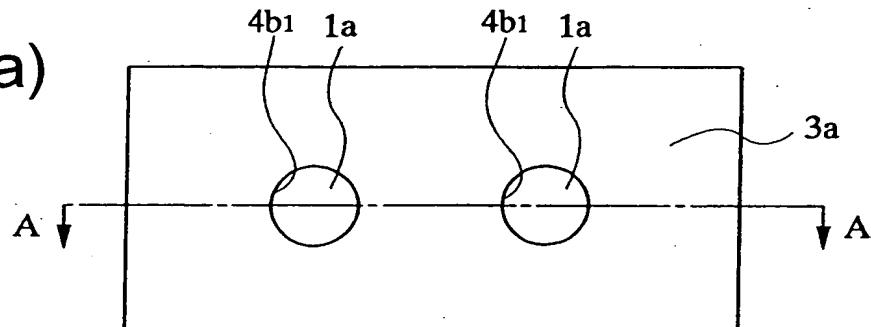


FIG. 17(b)

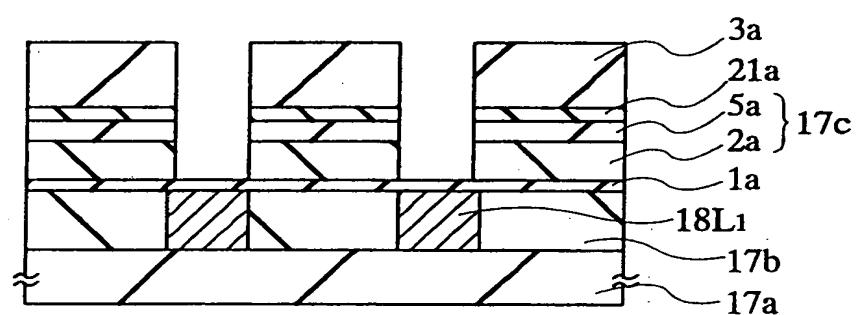


FIG. 18(a)

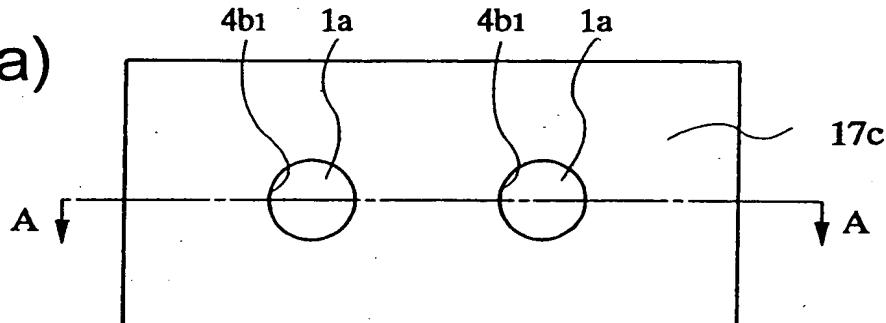
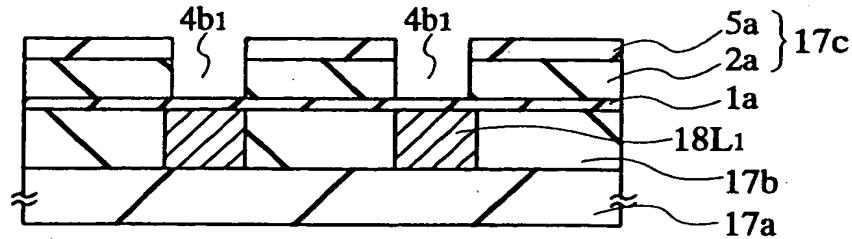


FIG. 18(b)



17 / 85

FIG. 19(a)

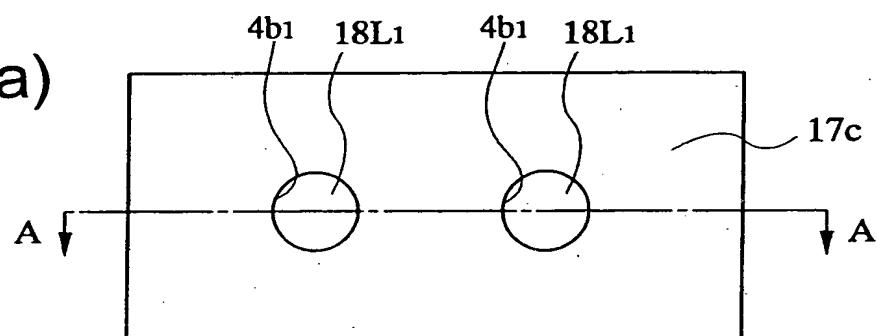


FIG. 19(b)

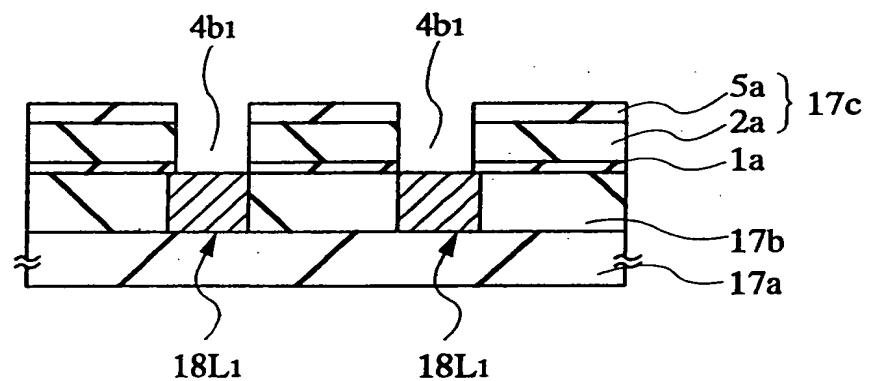


FIG. 20(a)

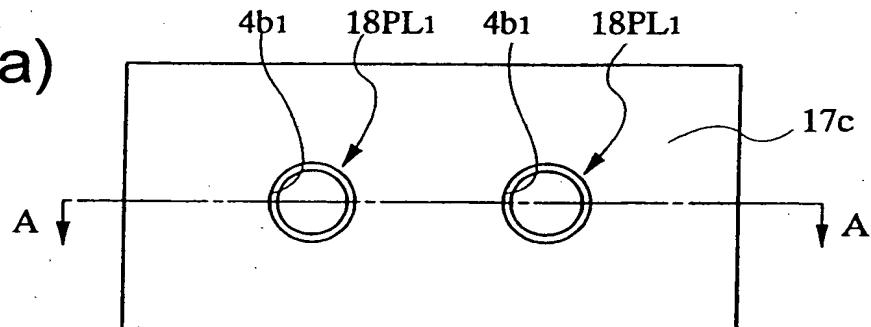


FIG. 20(b)

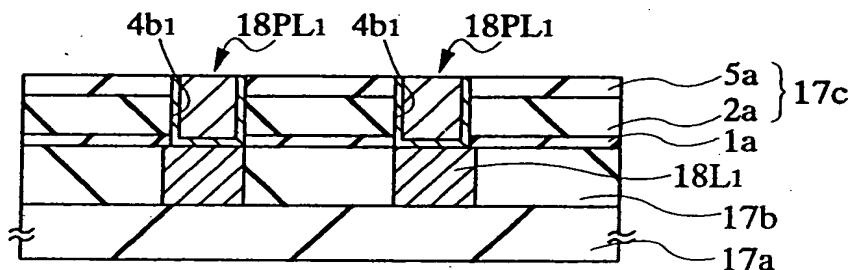


FIG. 21(a)

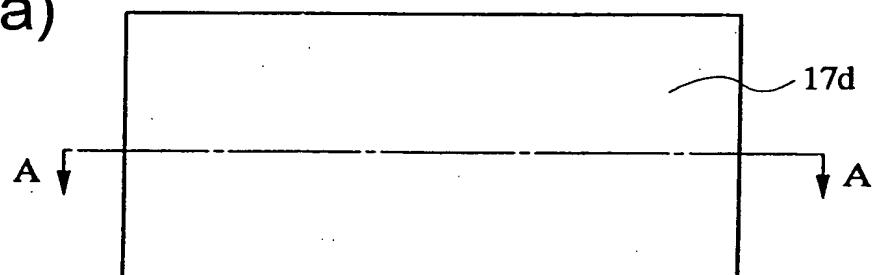


FIG. 21(b)

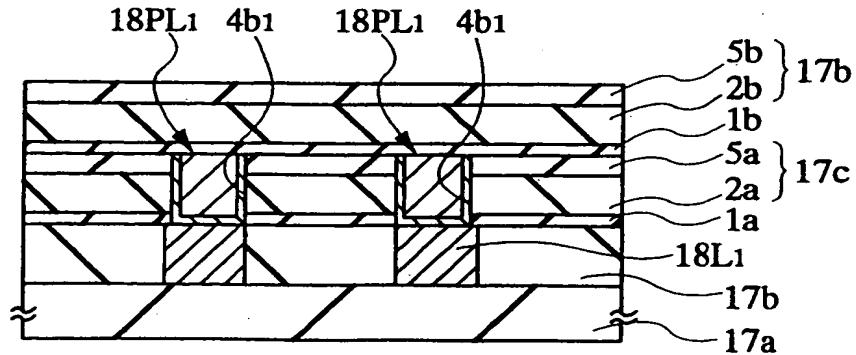


FIG. 22(a)

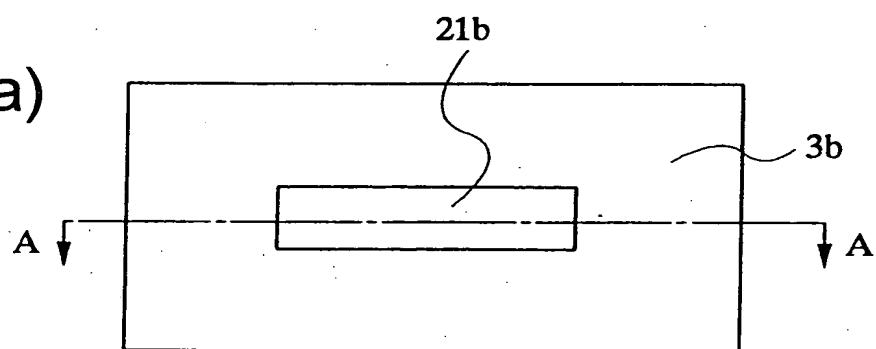


FIG. 22(b)

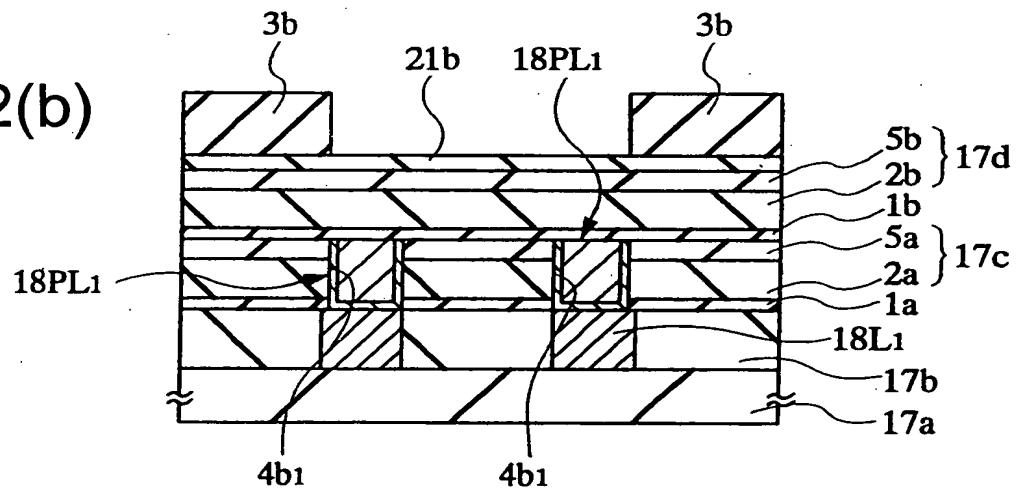


FIG. 23(a)

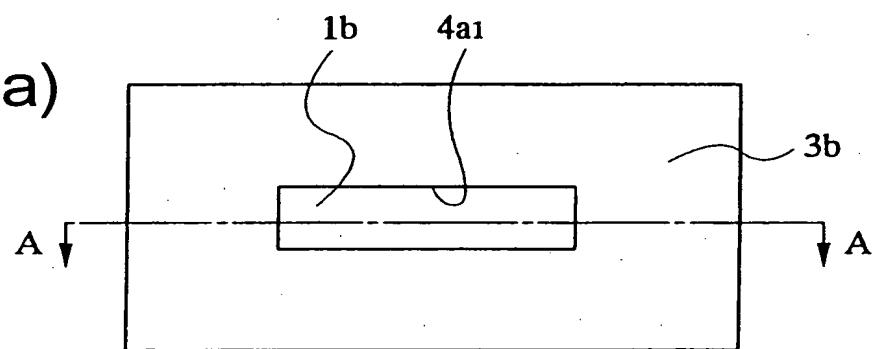


FIG. 23(b)

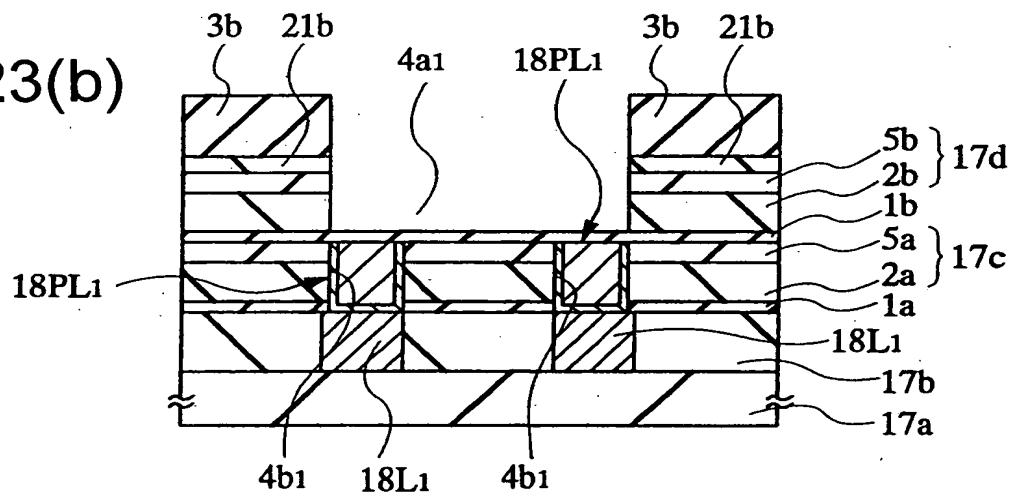


FIG. 24(a)

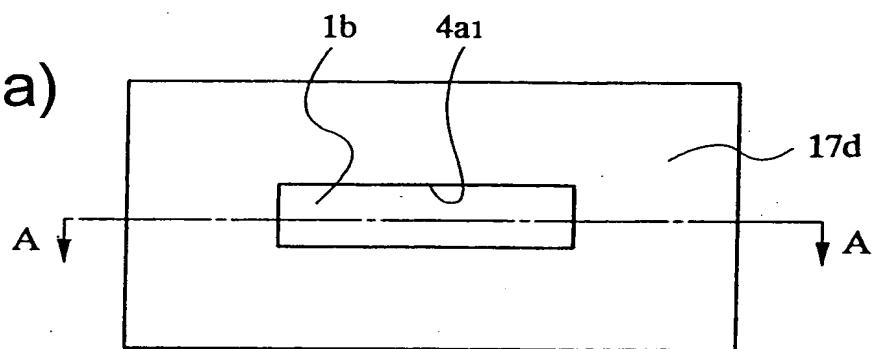


FIG. 24(b)

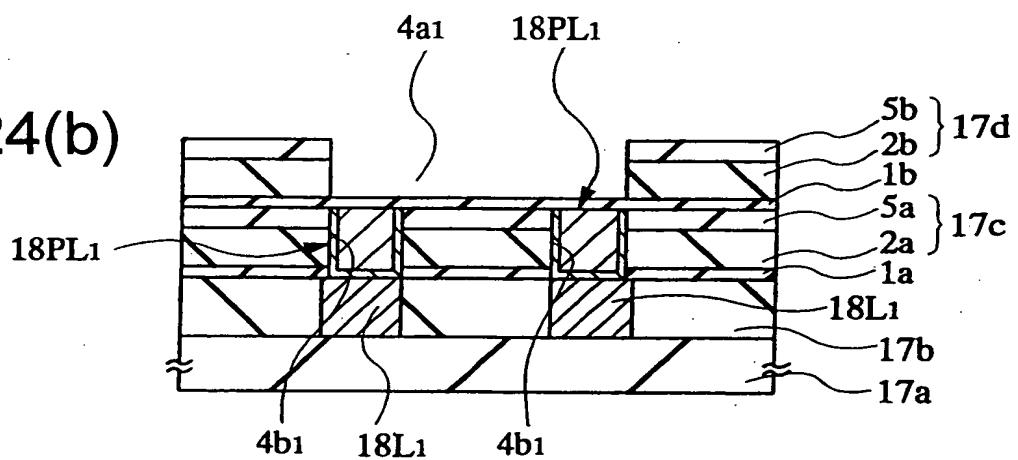


FIG. 25(a)

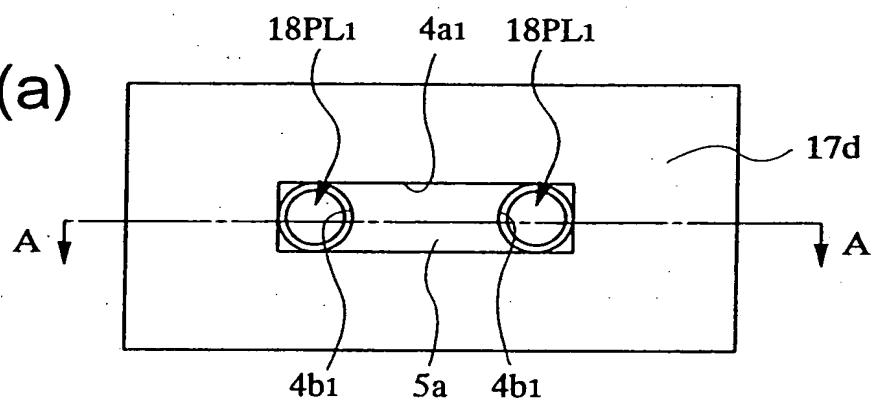


FIG. 25(b)

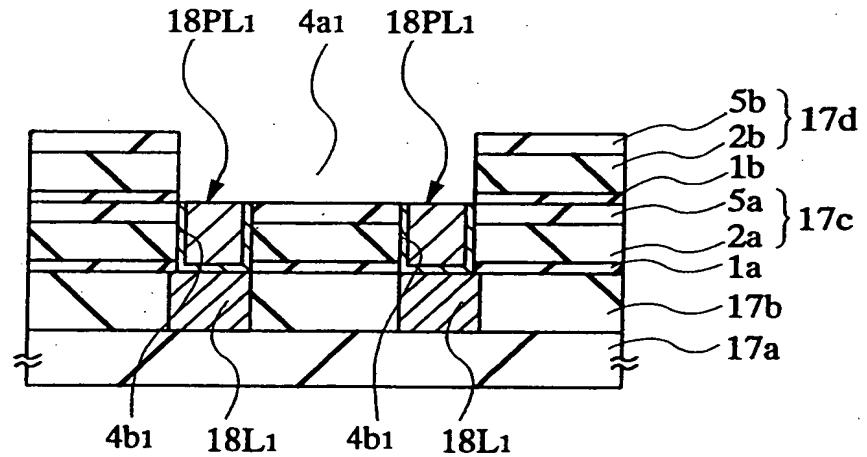


FIG. 26(a)

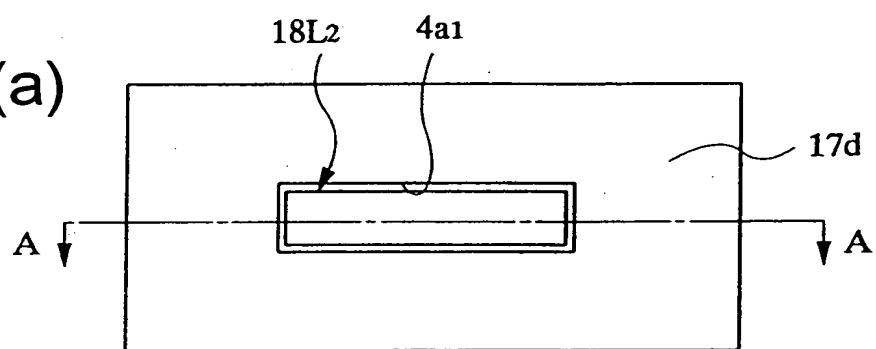
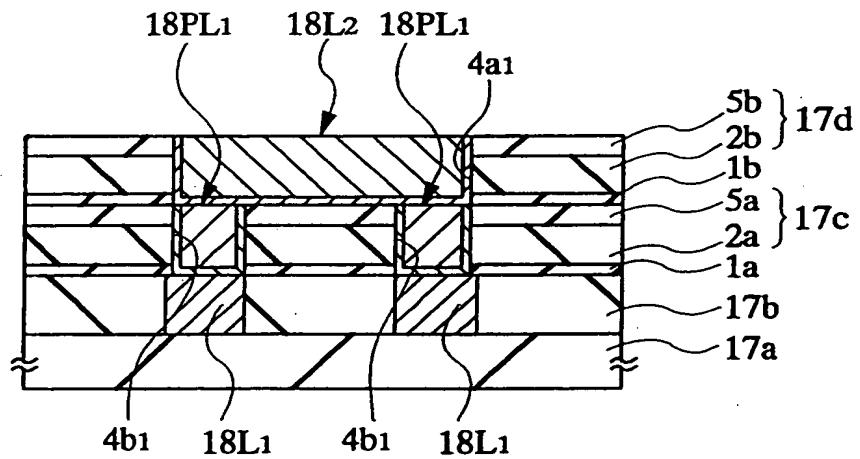


FIG. 26(b)



24 / 85

FIG. 27(a)

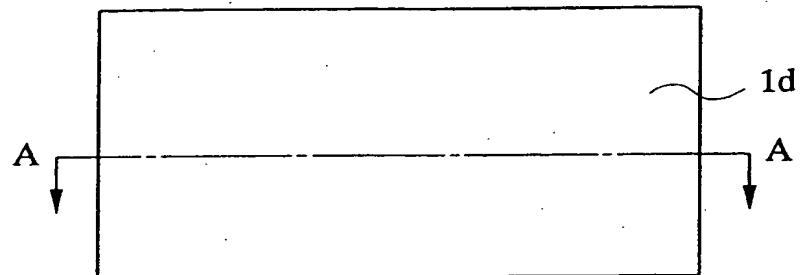


FIG. 27(b)

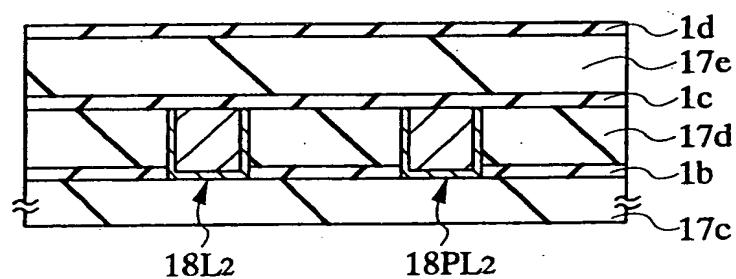


FIG. 28(a)

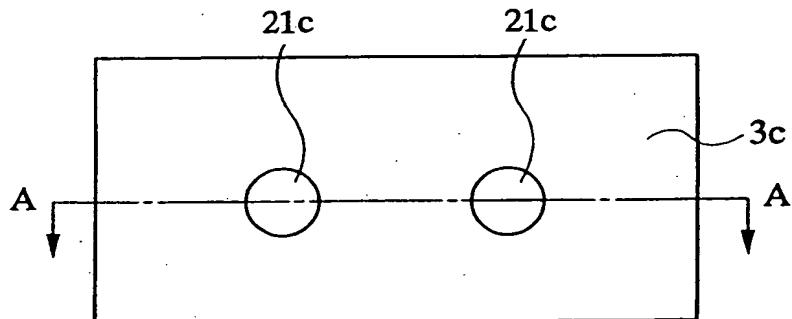


FIG. 28(b)

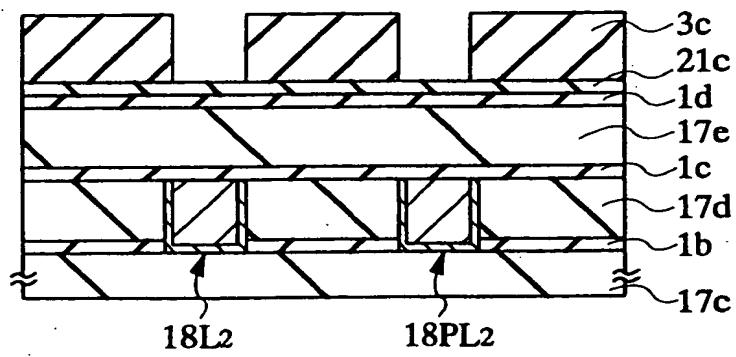


FIG. 29(a)

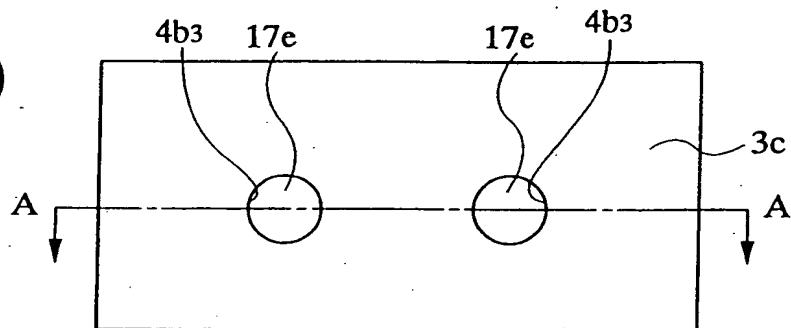


FIG. 29(b)

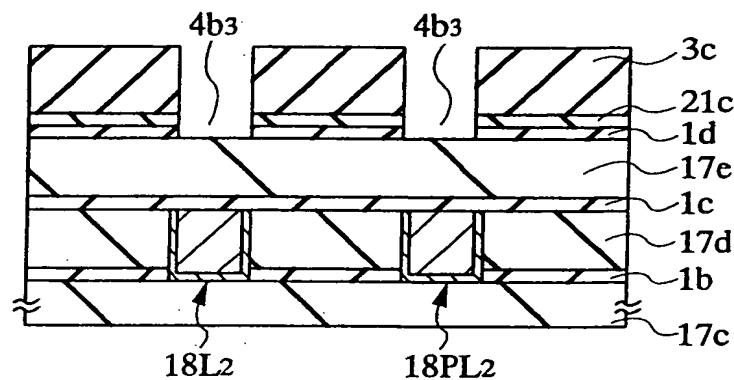


FIG. 30(a)

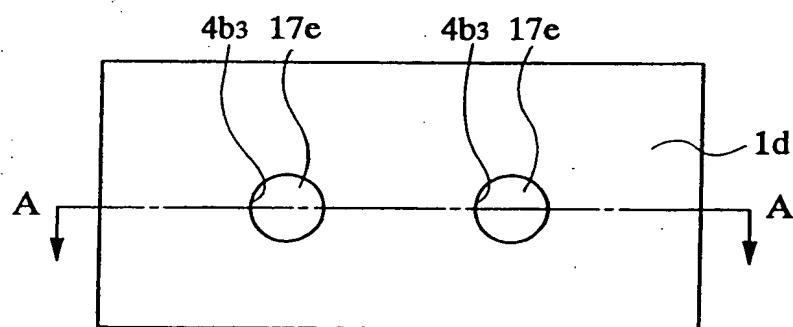


FIG. 30(b)

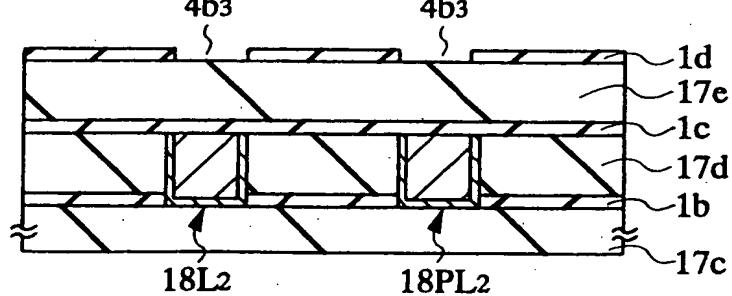


FIG. 31(a)

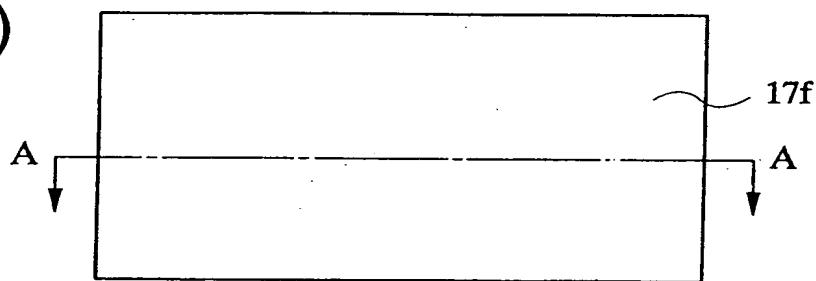


FIG. 31(b)

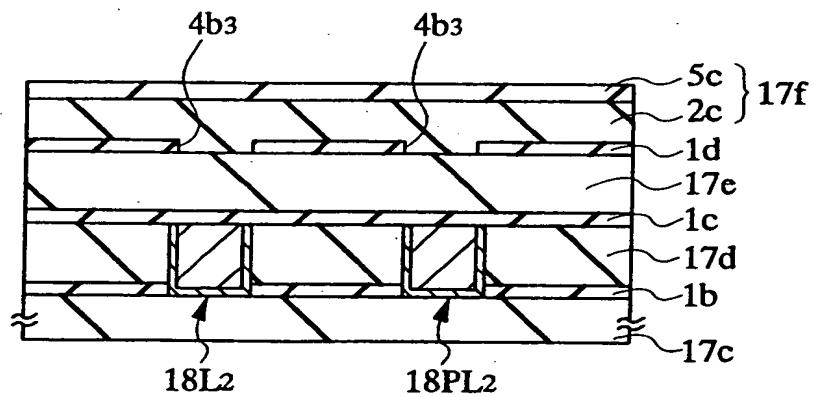


FIG. 32(a)

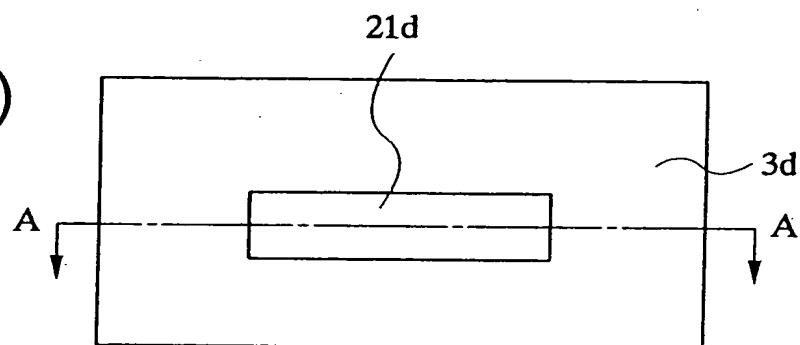


FIG. 32(b)

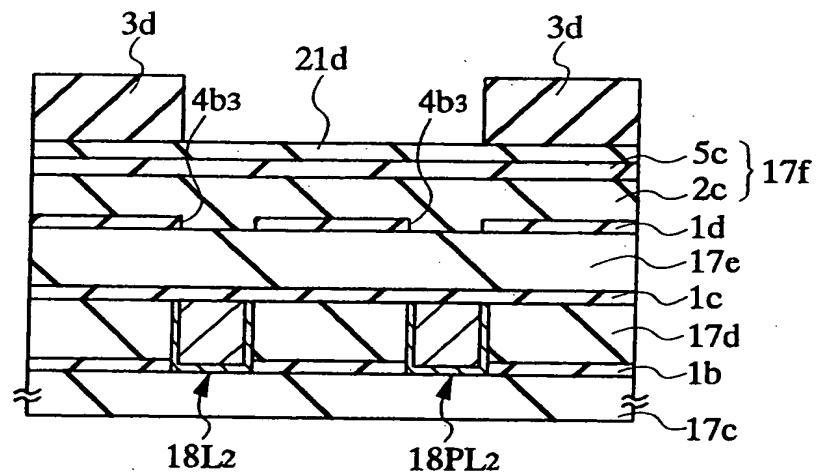


FIG. 33(a)

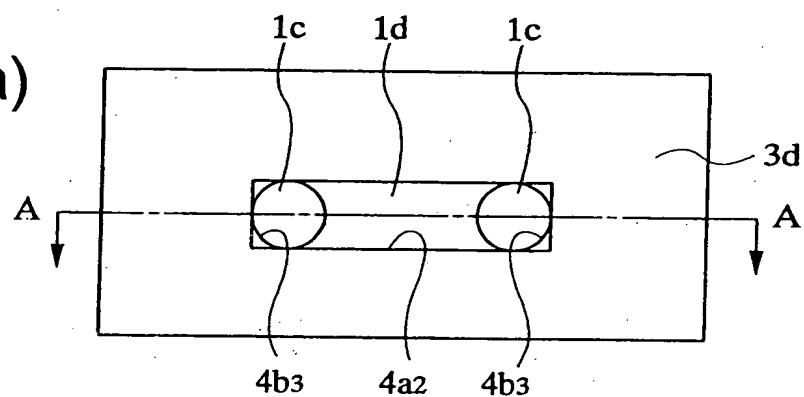


FIG. 33(b)

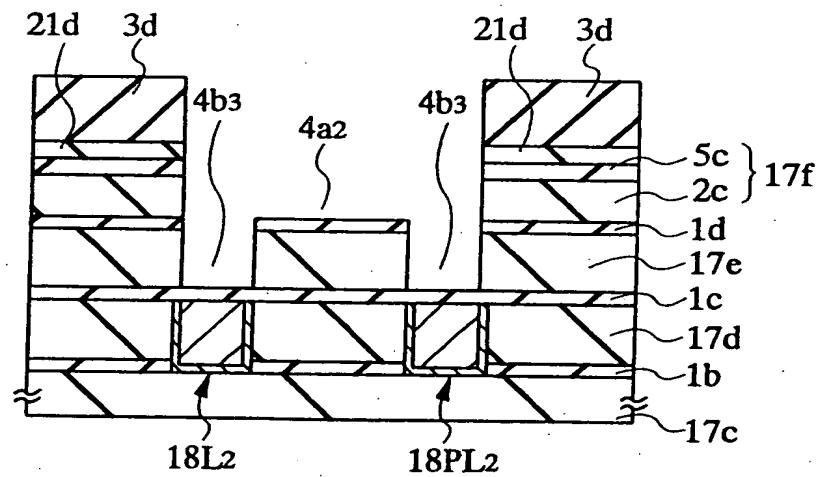


FIG. 34(a)

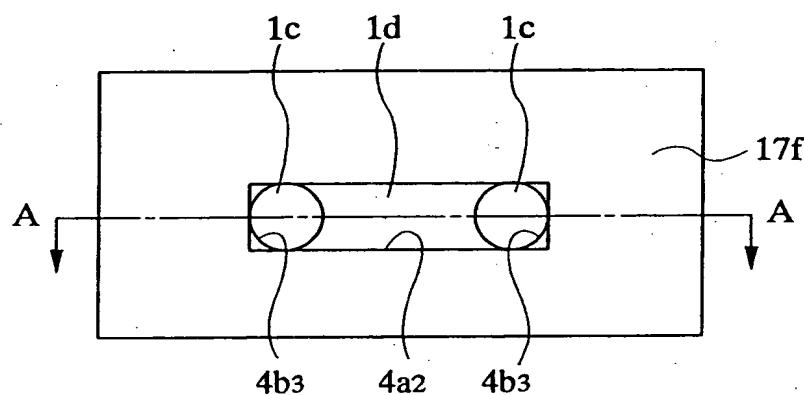


FIG. 34(b)

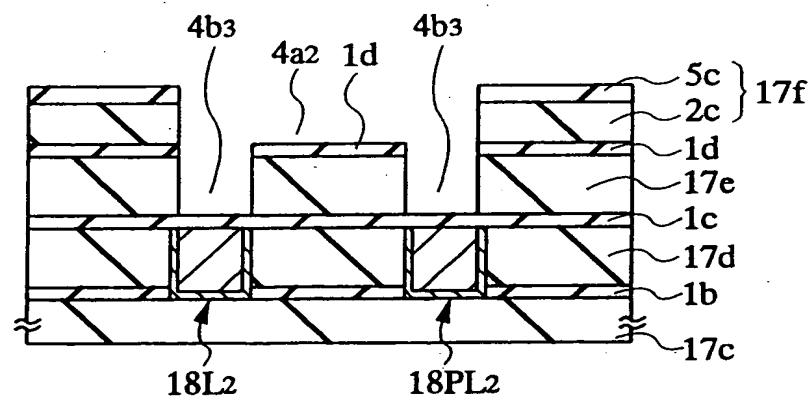


FIG. 35(a)

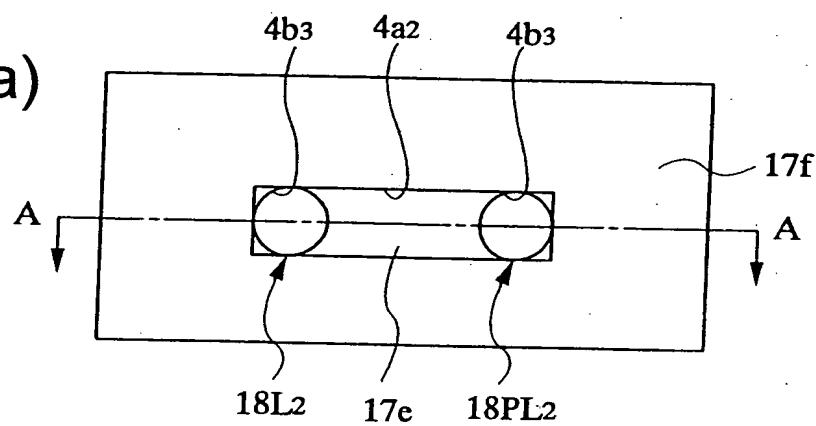


FIG. 35(b)

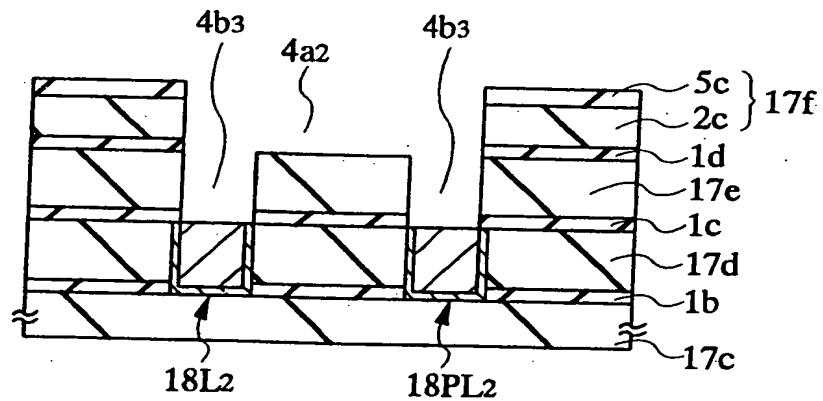


FIG. 36(a)

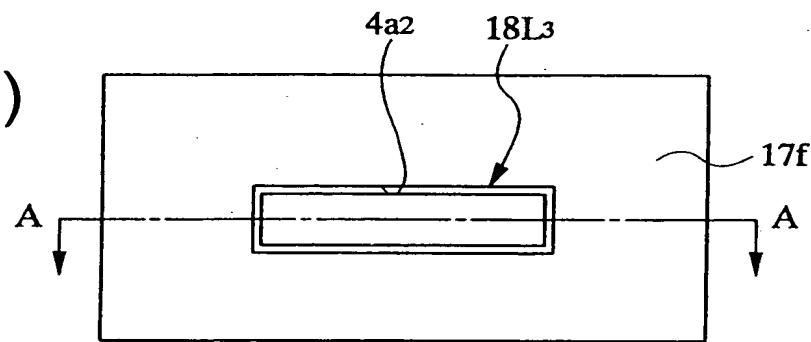


FIG. 36(b)

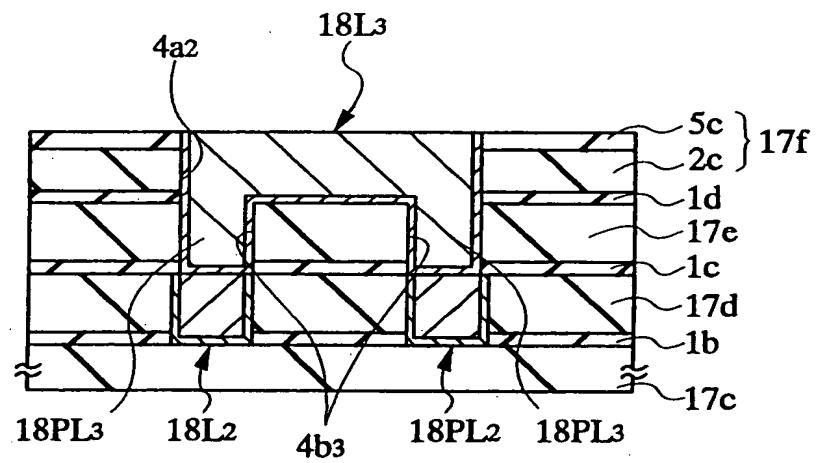


FIG. 37(a)

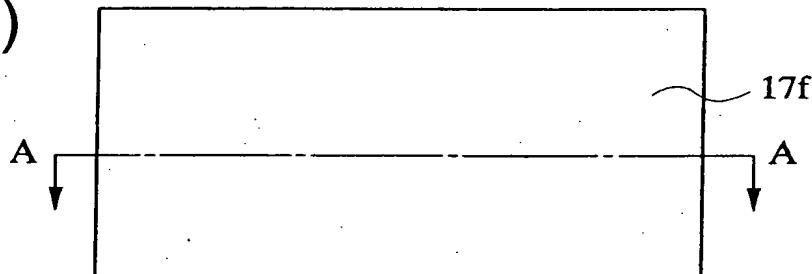


FIG. 37(b)

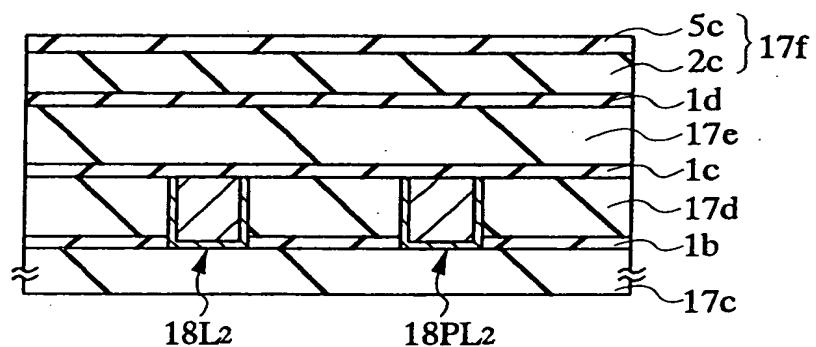


FIG. 38(a)

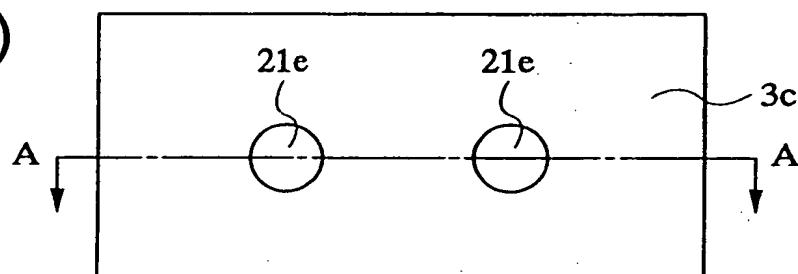


FIG. 38(b)

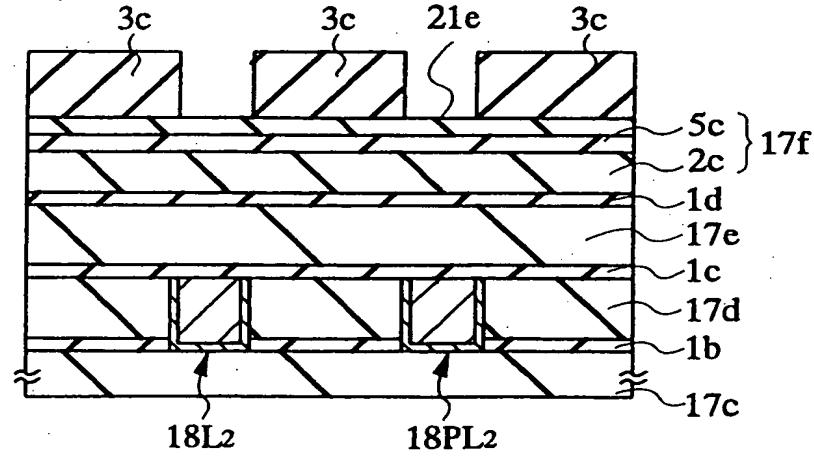


FIG. 39(a)

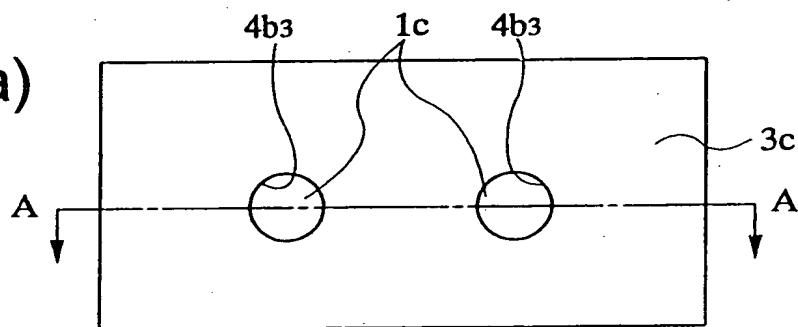


FIG. 39(b)

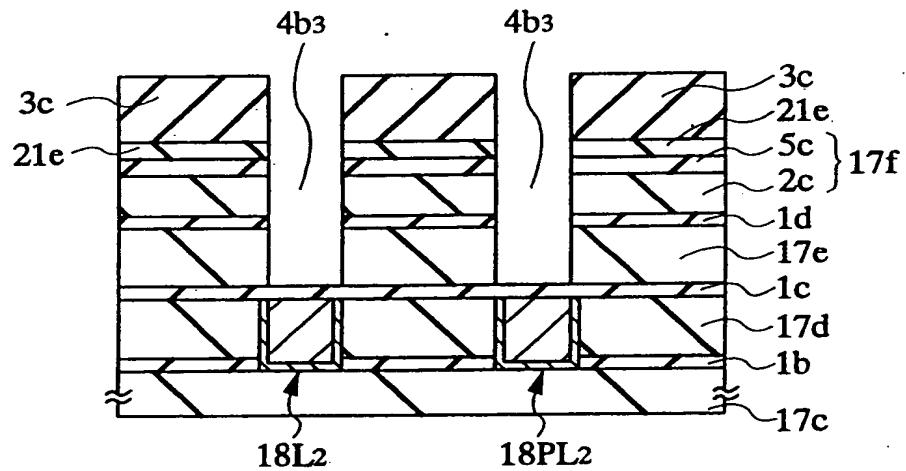


FIG. 40(a)

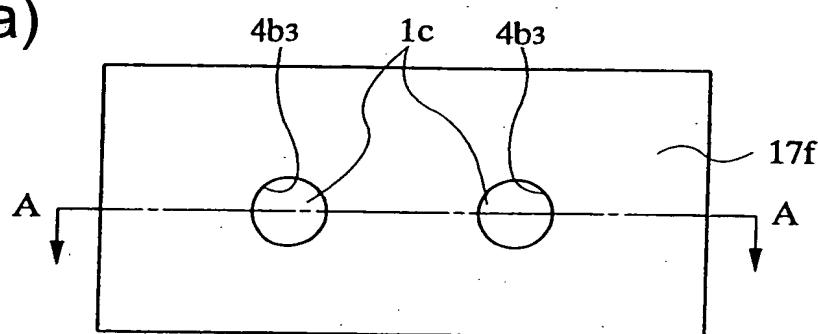


FIG. 40(b)

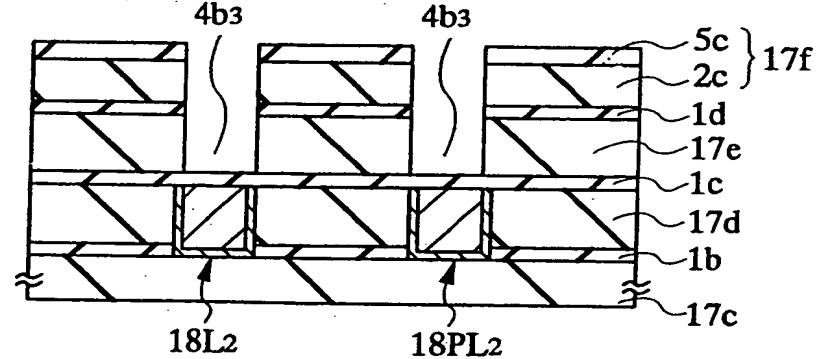


FIG. 41(a)

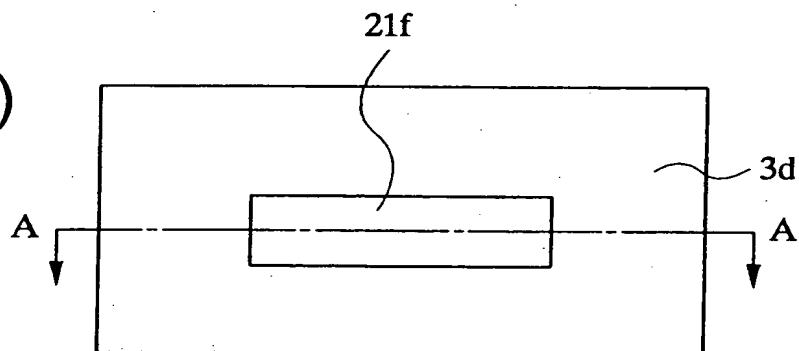
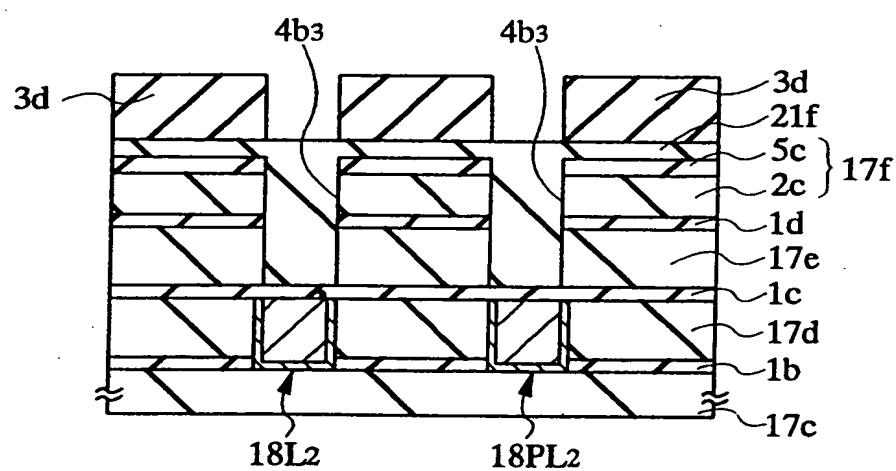


FIG. 41(b)



36 / 85

FIG. 42(a)

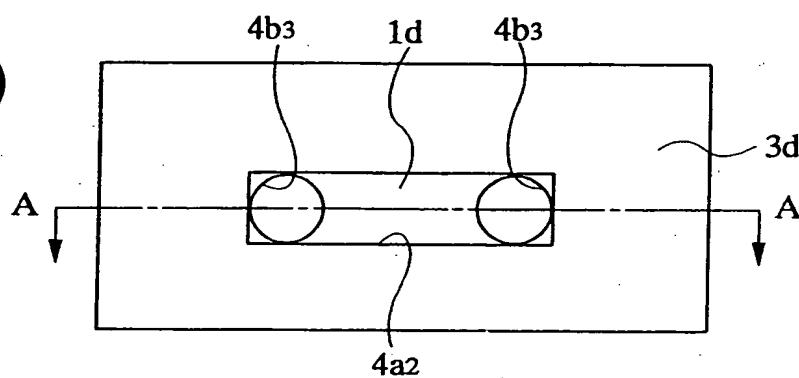
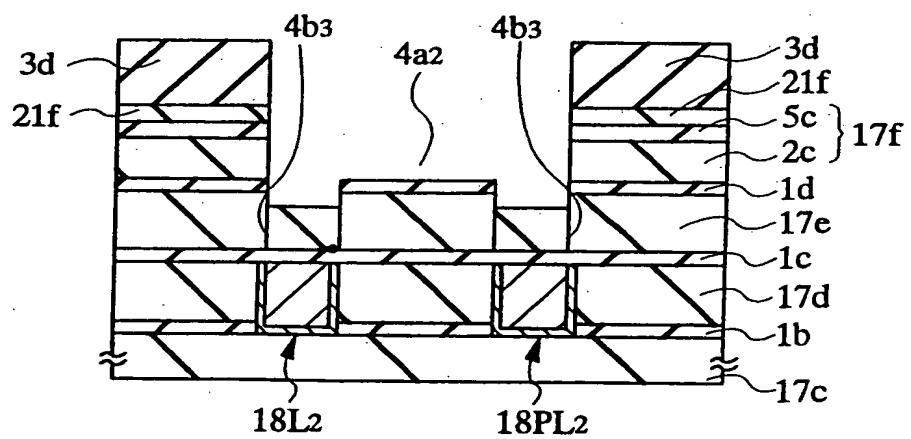


FIG. 42(b)



37 / 85

FIG. 43(a)

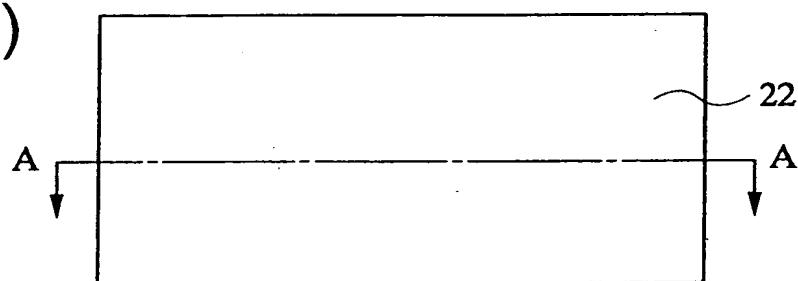


FIG. 43(b)

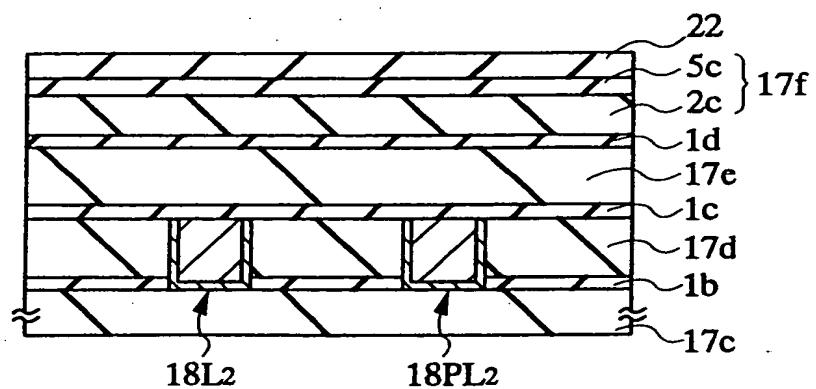


FIG. 44(a)

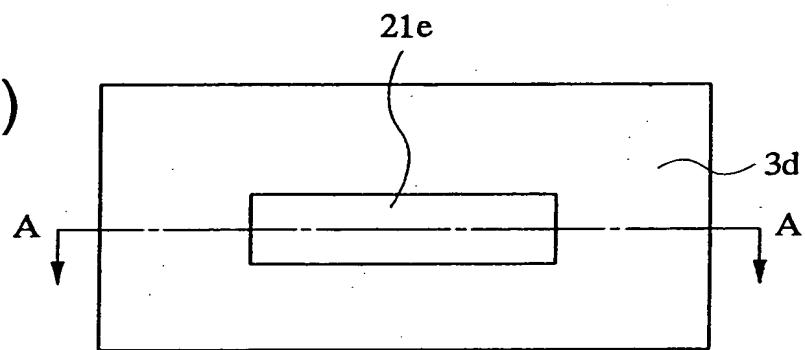


FIG. 44(b)

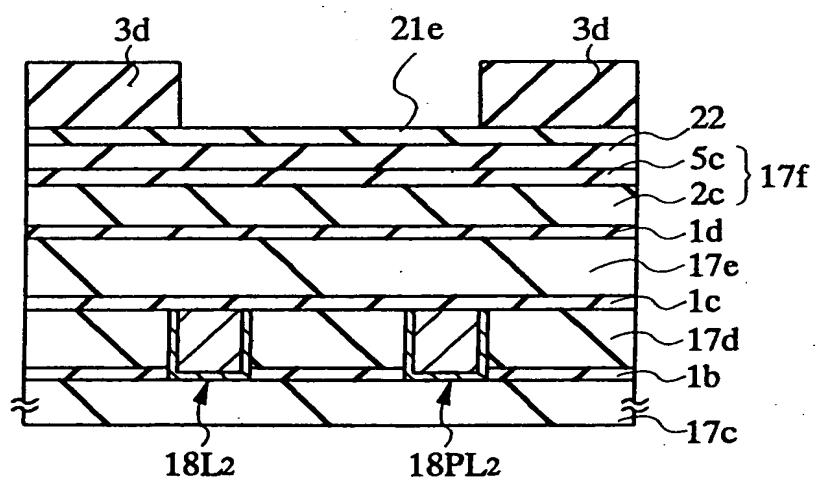


FIG. 45(a)

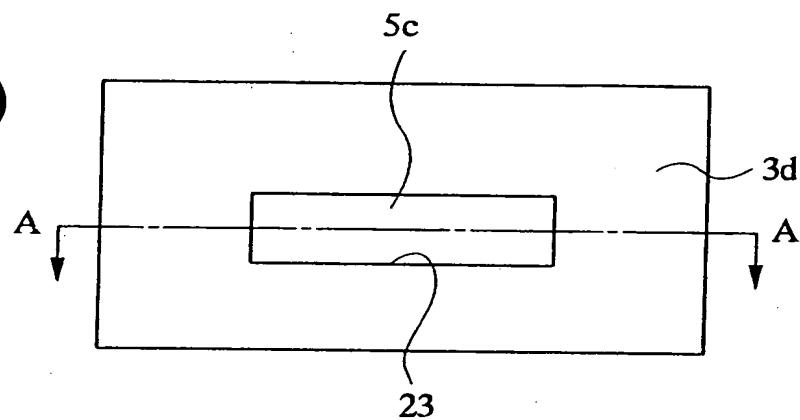
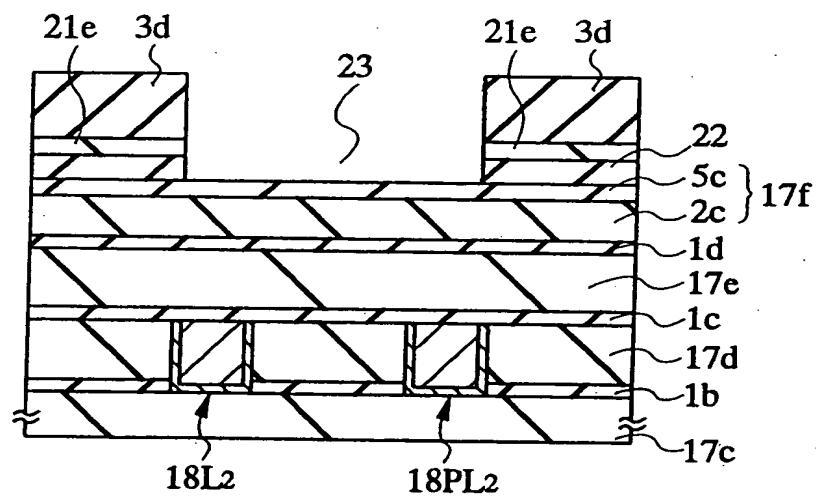


FIG. 45(b)



40 / 85

FIG. 46(a)

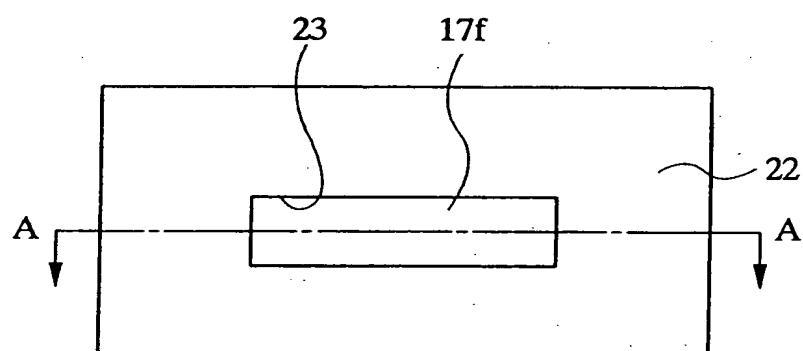
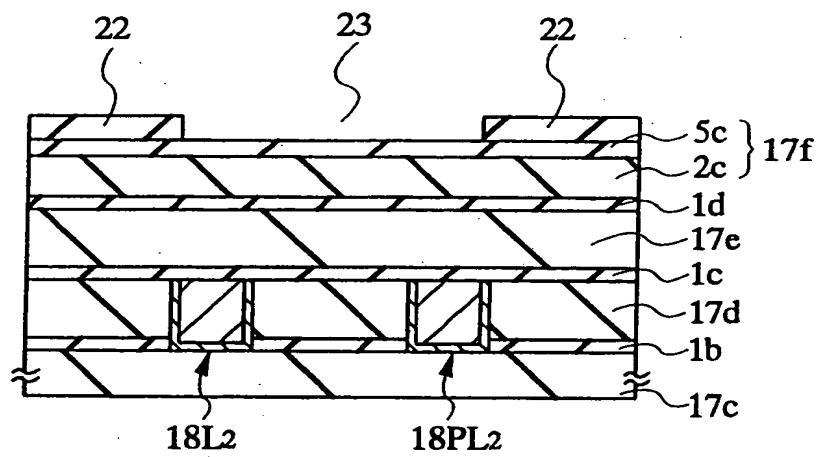


FIG. 46(b)



41 / 85

FIG. 47(a)

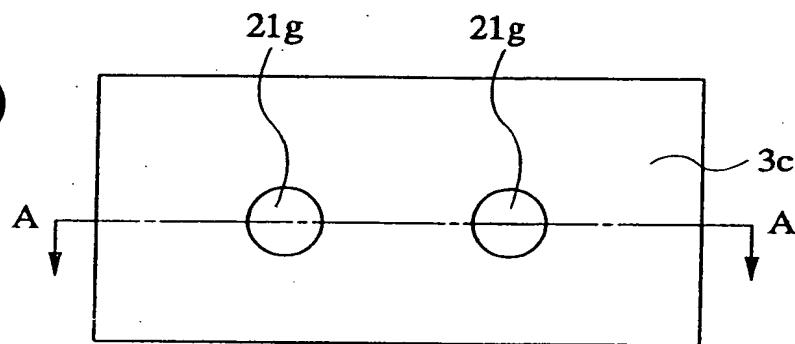


FIG. 47(b)

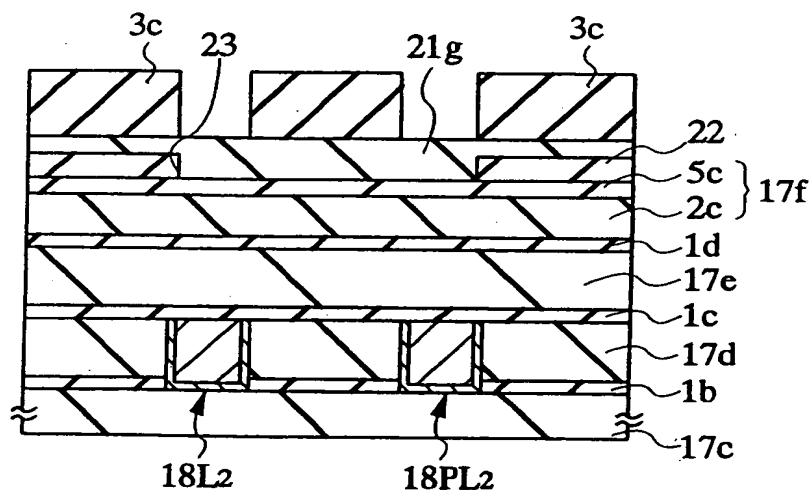


FIG. 48(a)

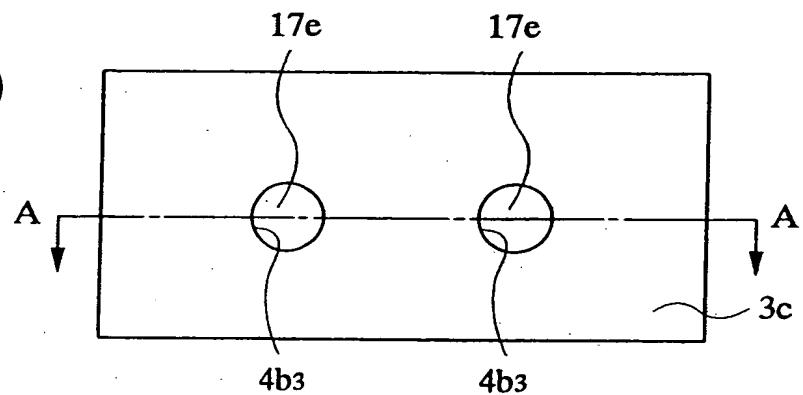


FIG. 48(b)

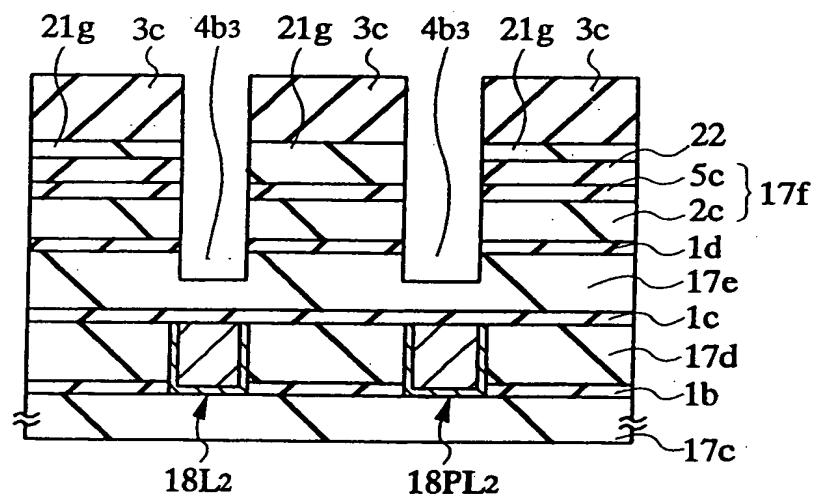


FIG. 49(a)

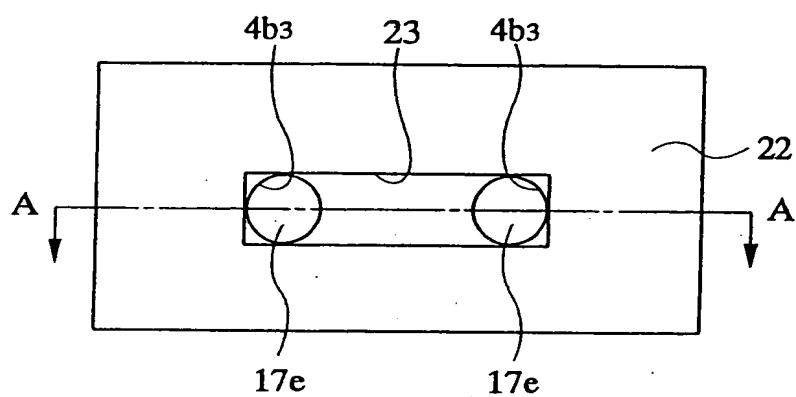


FIG. 49(b)

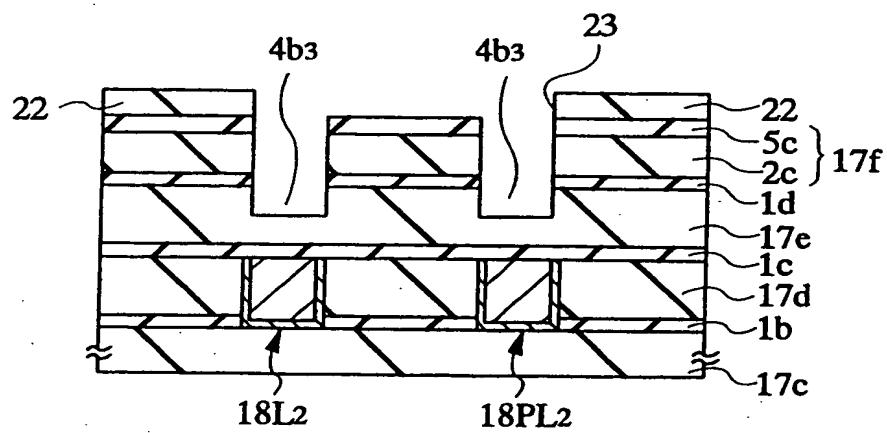


FIG. 50(a)

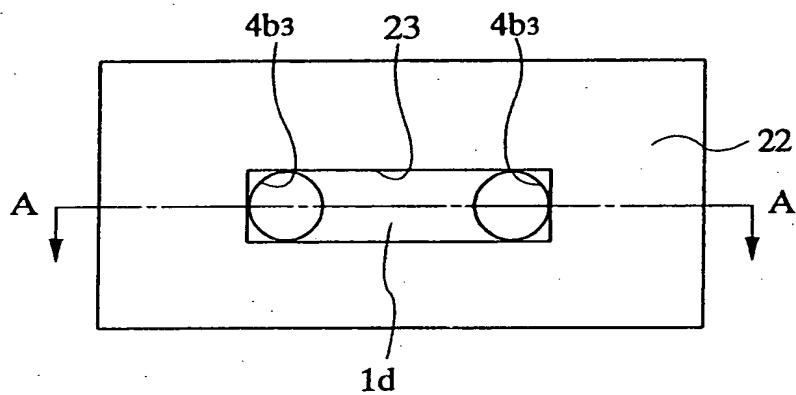
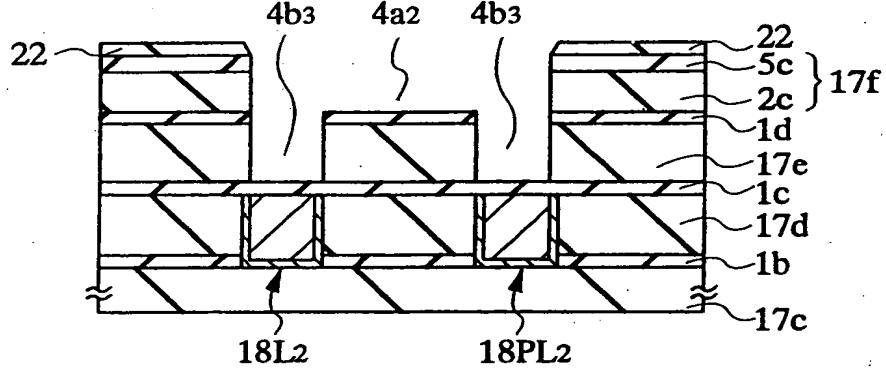


FIG. 50(b)



45 / 85

FIG. 51(a)

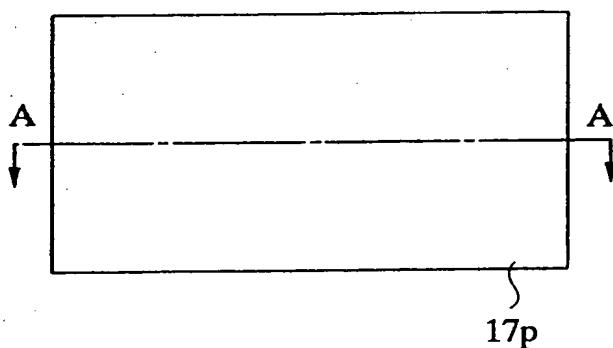


FIG. 51(b)

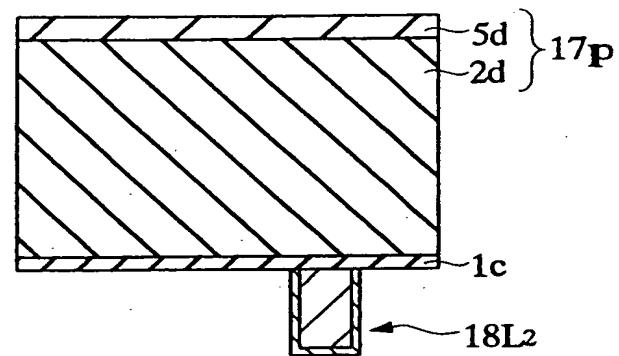


FIG. 52(a)

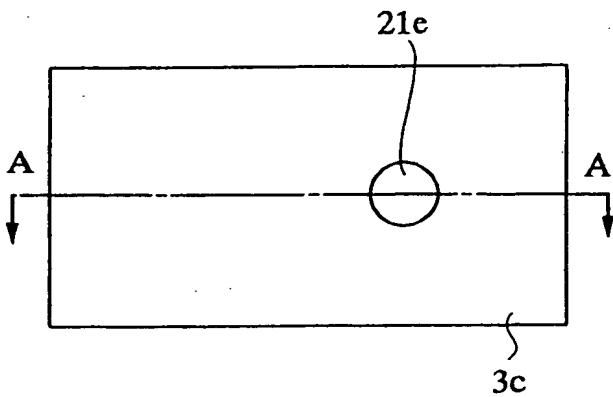
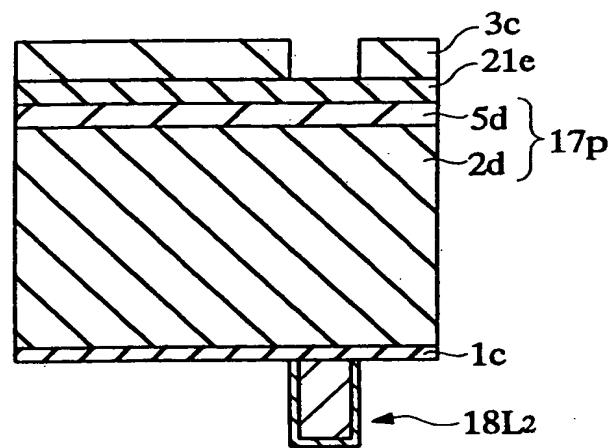


FIG. 52(b)



46 / 85

FIG. 53(a)

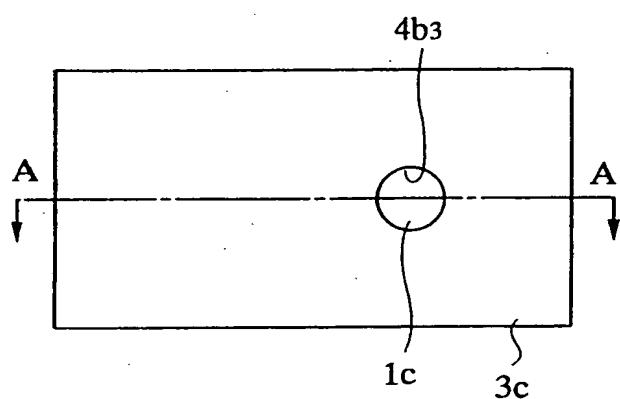


FIG. 53(b)

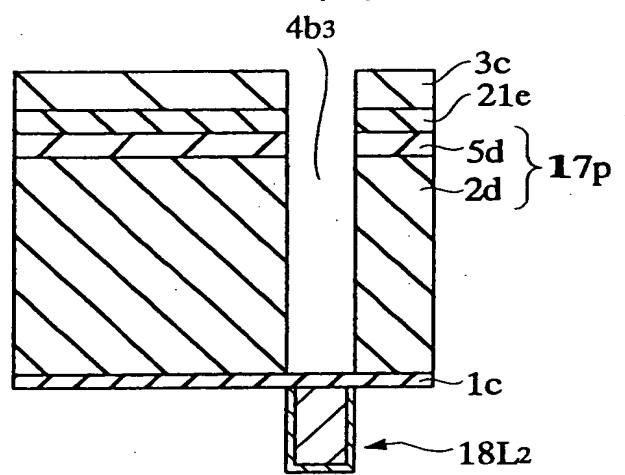


FIG. 54(a)

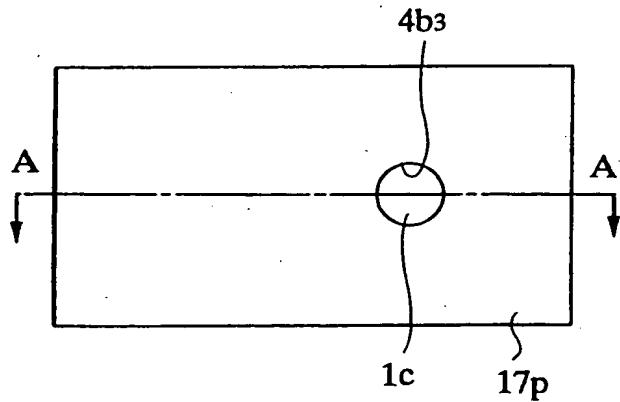


FIG. 54(b)

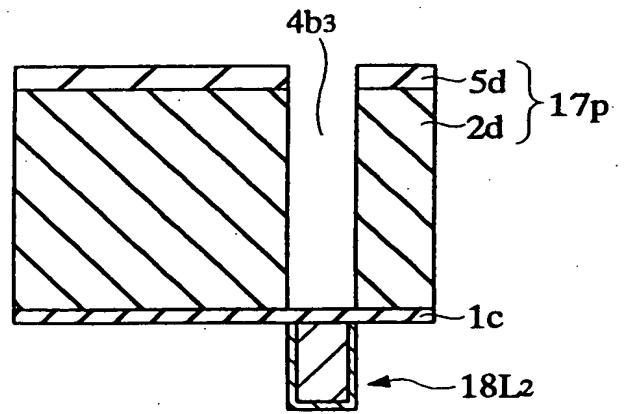


FIG. 55(a)

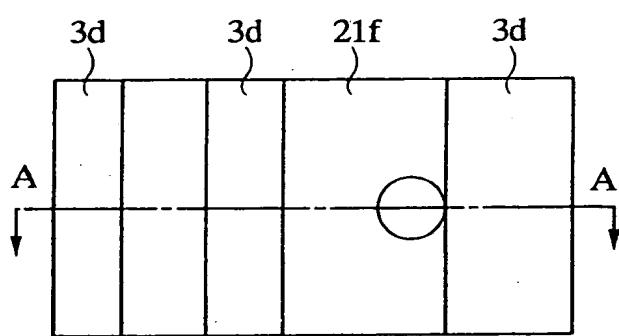


FIG. 55(b)

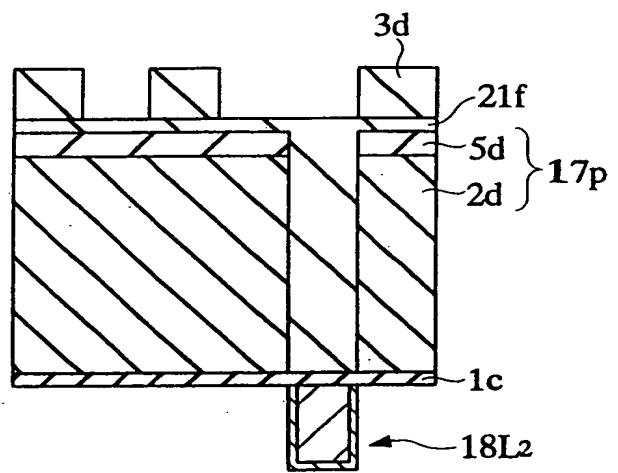


FIG. 56(a)

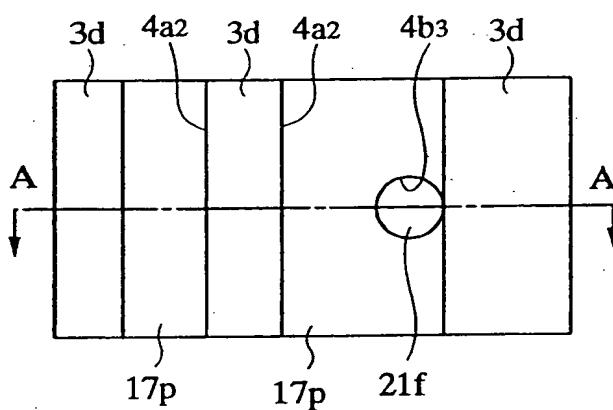


FIG. 56(b)

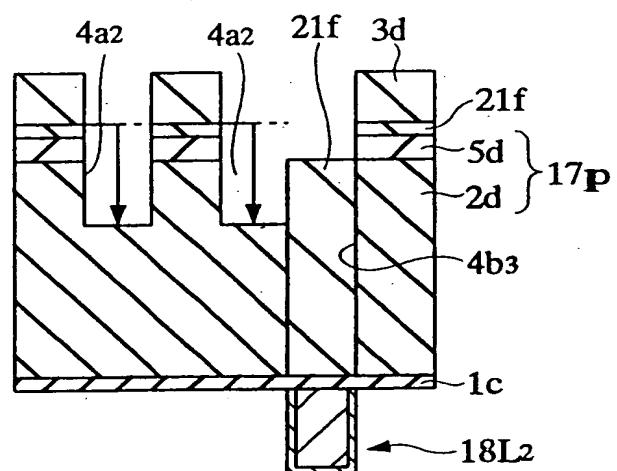


FIG. 57(a)

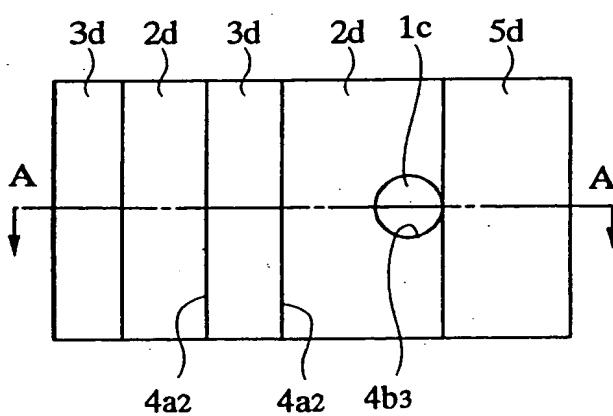


FIG. 57(b)

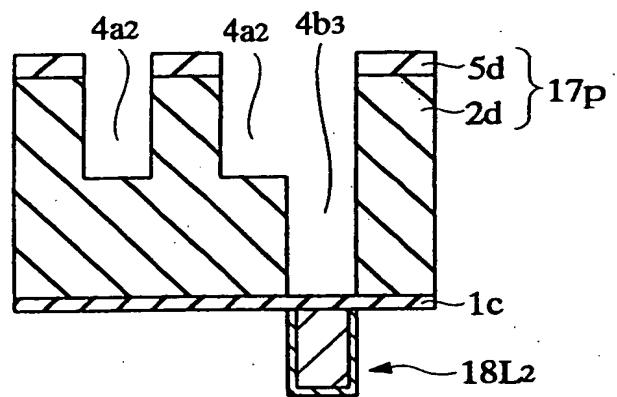


FIG. 58(a)

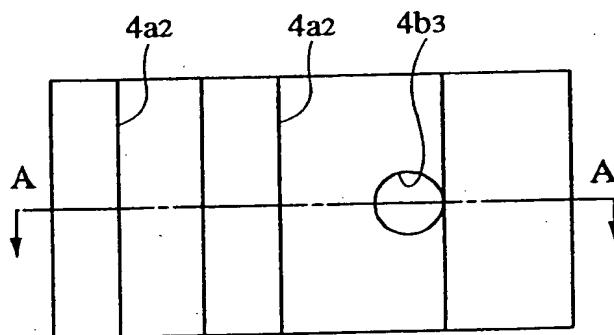


FIG. 58(b)

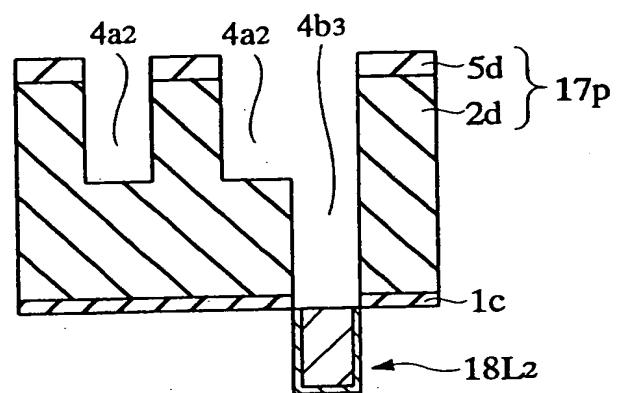


FIG. 59(a)

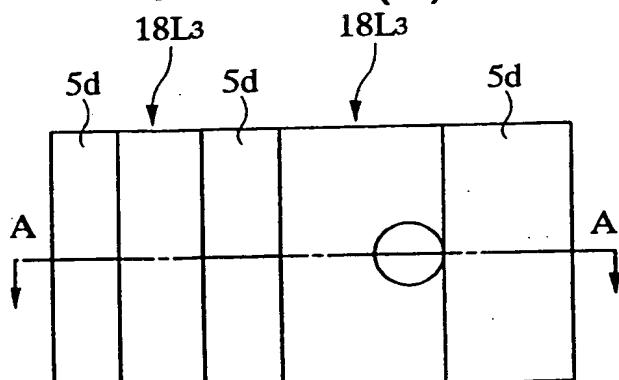


FIG. 59(b)

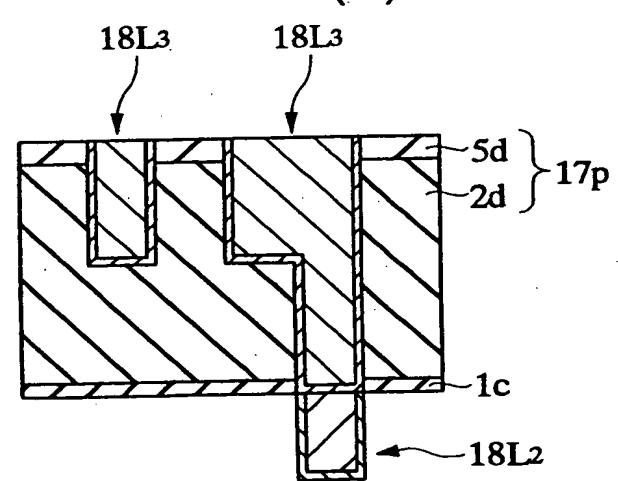


FIG. 60

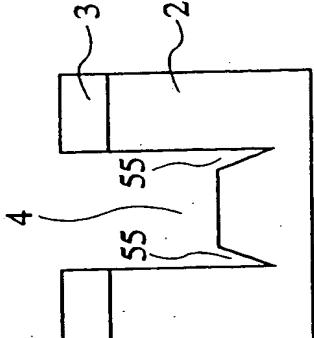
C <sub>4</sub> F <sub>8</sub> FLOW RATE > O <sub>2</sub> FLOW RATE	C <sub>4</sub> F <sub>8</sub> FLOW RATE ≤ O <sub>2</sub> FLOW RATE
SCHEMATIC CROSS-SECTIONAL VIEW	
FORM	<input type="radio"/> ○ (HAVING A SIDE TRENCH) <input checked="" type="radio"/> X (NOT GREATER THAN 5)
SELECTIVITY TO SiN	<input type="radio"/> ○ (NOT GREATER THAN 2) <input checked="" type="radio"/> X (NOT GREATER THAN 5)
ETCHING APPARATUS	TOKYO ELECTRON IEM
ETCHING GAS	C <sub>4</sub> F <sub>8</sub> /O <sub>2</sub> /Ar
PRESSURE	25 mTorr
HIGH-FREQUENCY POWER	30 mTorr
STAGE TEMPERATURE	2200 / 1400 W
	-20 °C

FIG. 61(a)

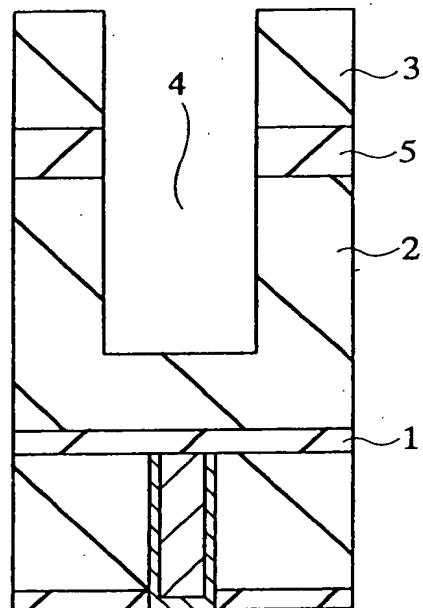


FIG. 61(b)

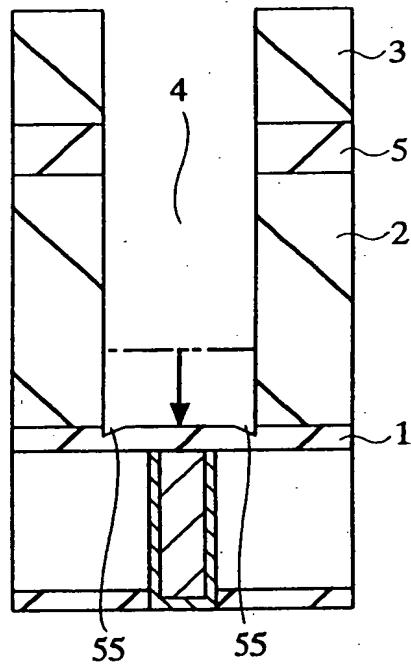


FIG. 62(a)

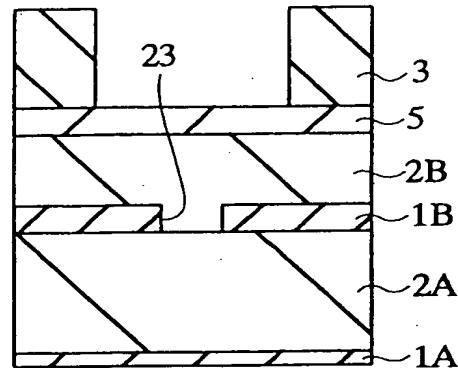


FIG. 62(b)

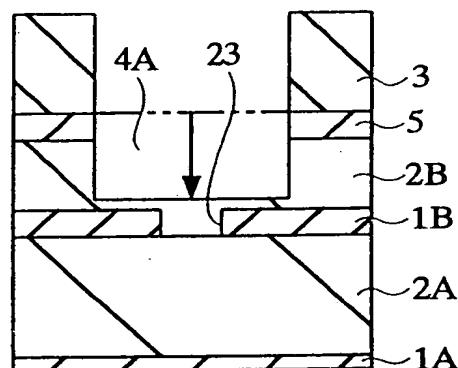


FIG. 62(c)

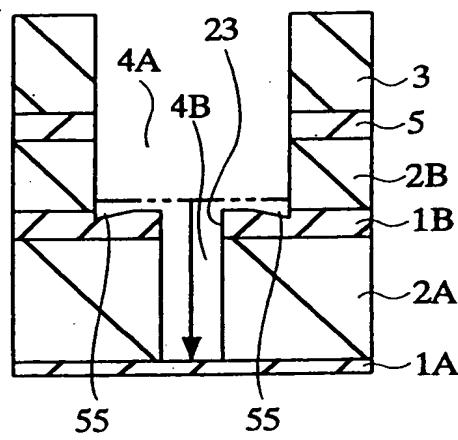


FIG. 63(a)

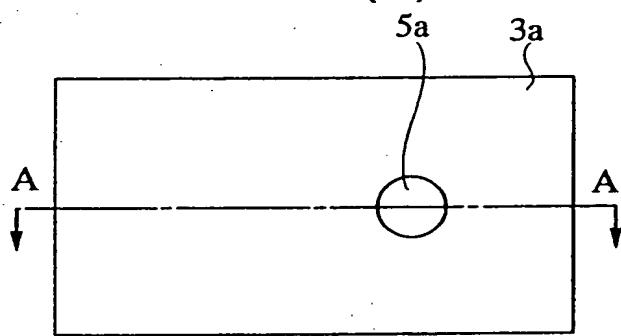


FIG. 63(b)

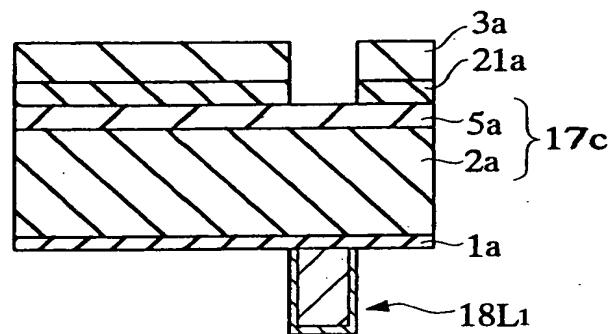


FIG. 64(a)

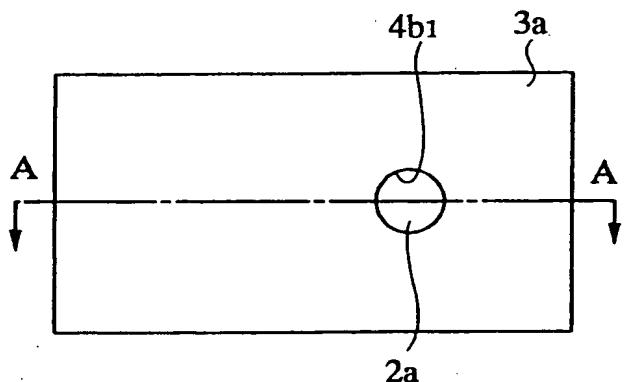


FIG. 64(b)

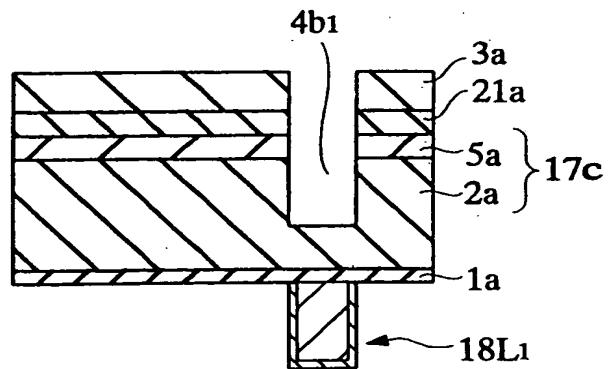


FIG. 65(a)

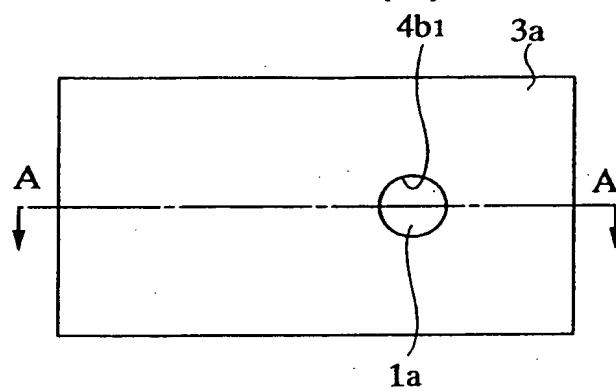


FIG. 65(b)

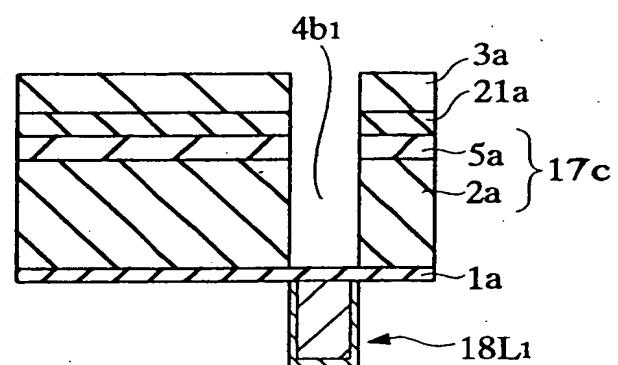


FIG. 66(a)

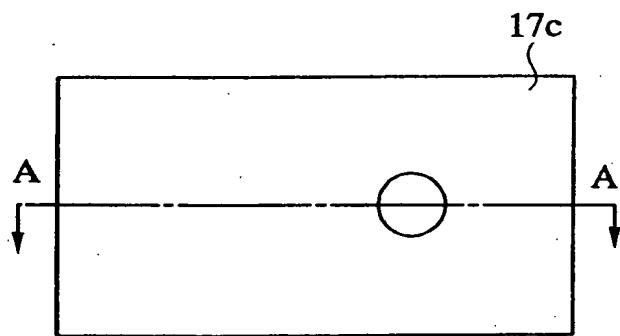


FIG. 66(b)

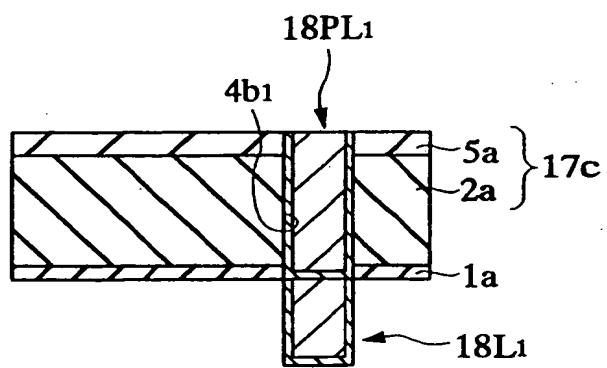


FIG. 67(a)

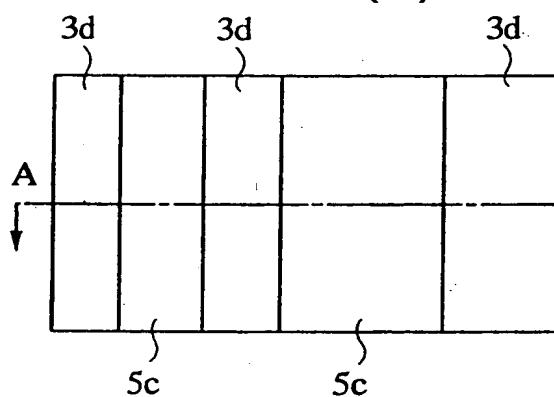


FIG. 67(b)

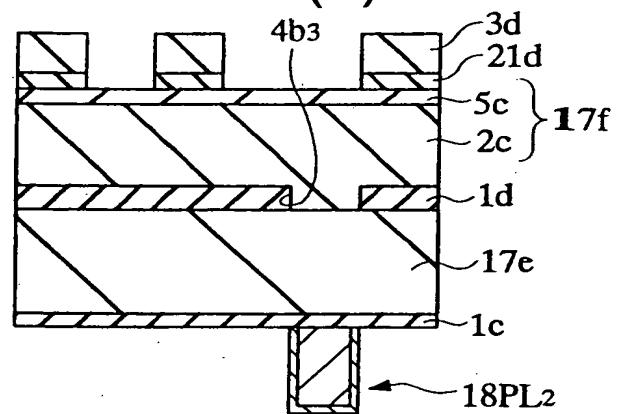


FIG. 68(a)

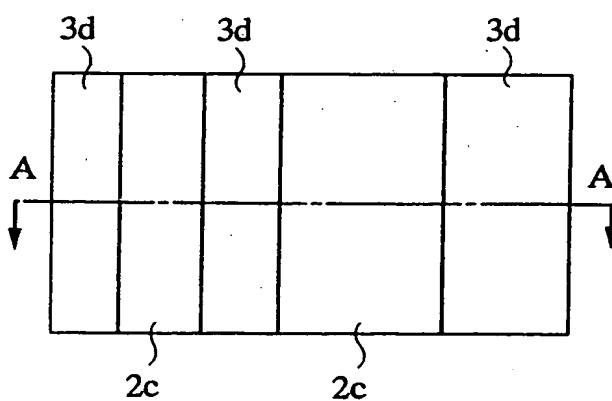


FIG. 68(b)

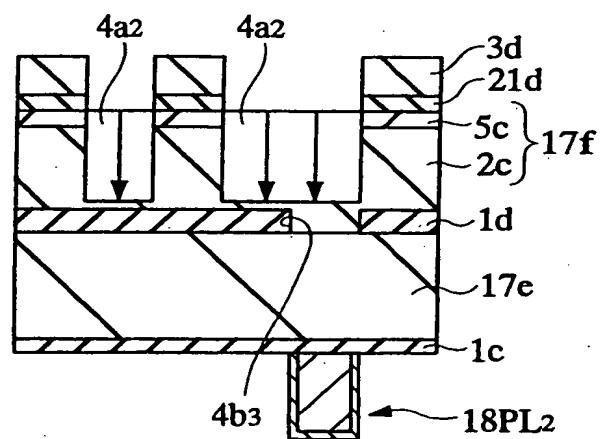


FIG. 69(a)

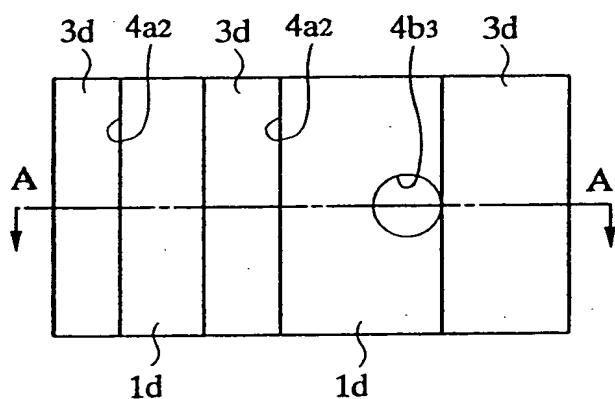


FIG. 69(b)

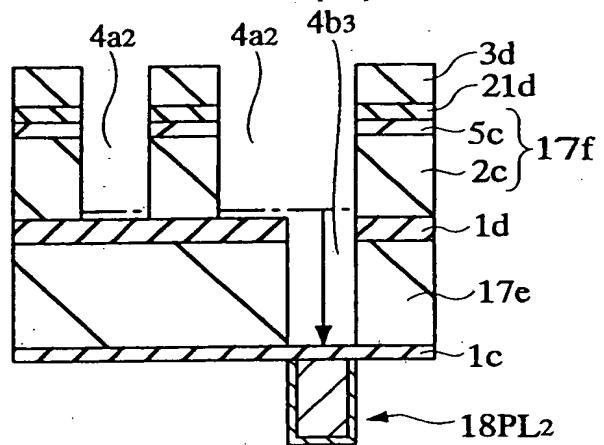


FIG. 70(a)

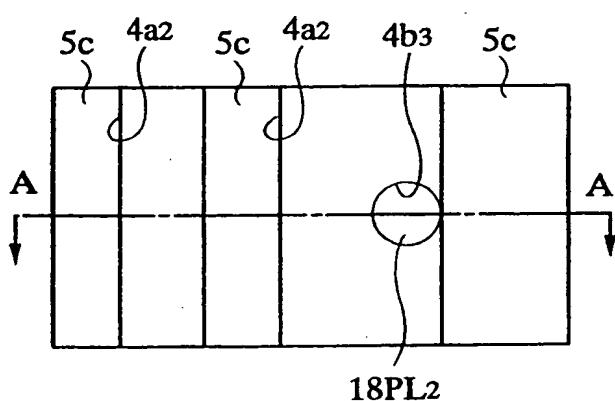


FIG. 70(b)

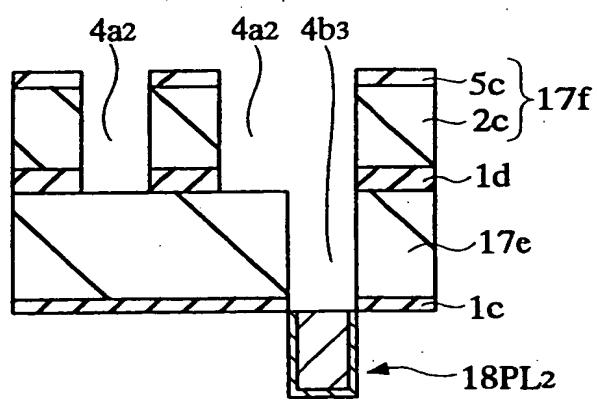


FIG. 71(a)

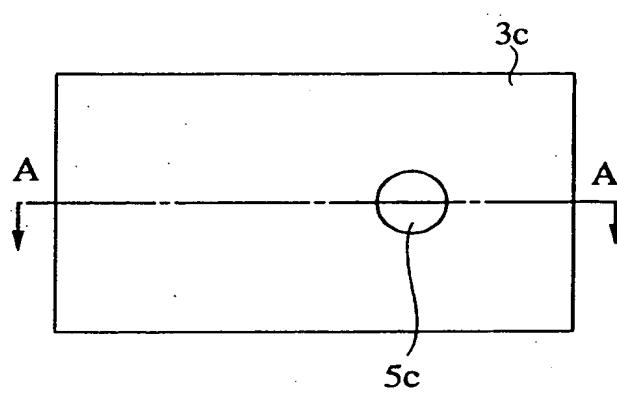


FIG. 71(b)

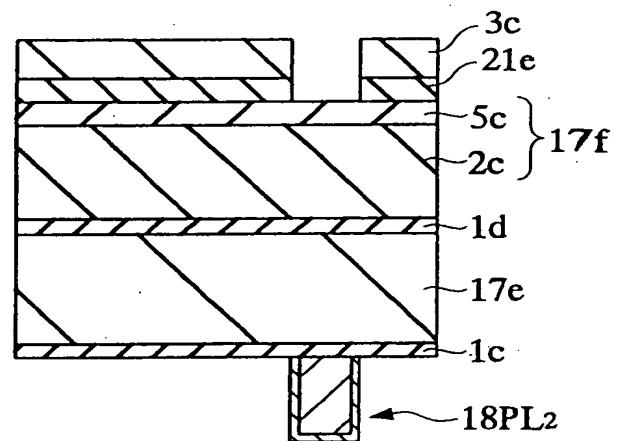


FIG. 72(a)

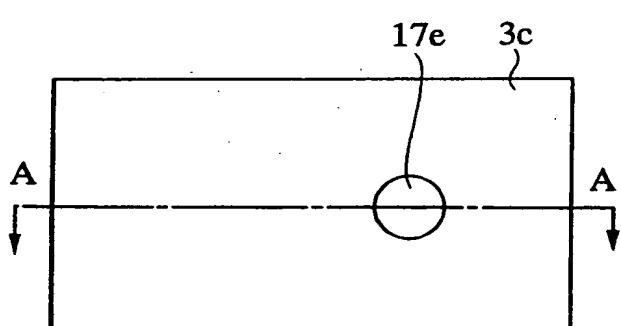


FIG. 72(b)

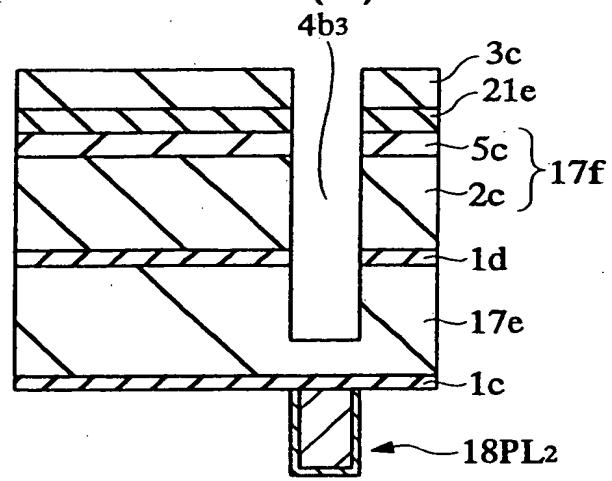


FIG. 73(a)

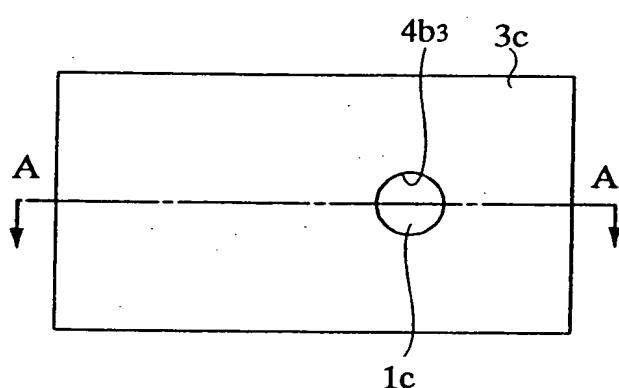


FIG. 73(b)

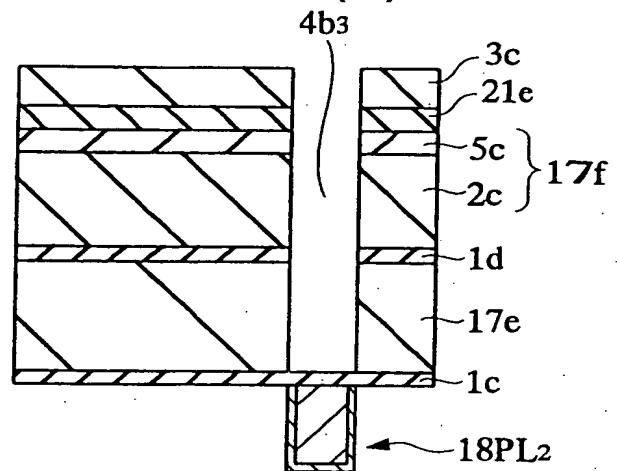


FIG. 74(a)

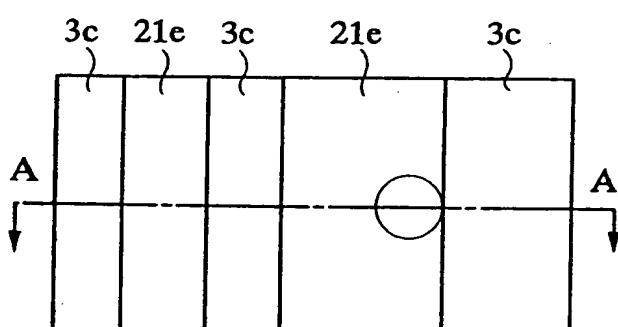


FIG. 74(b)

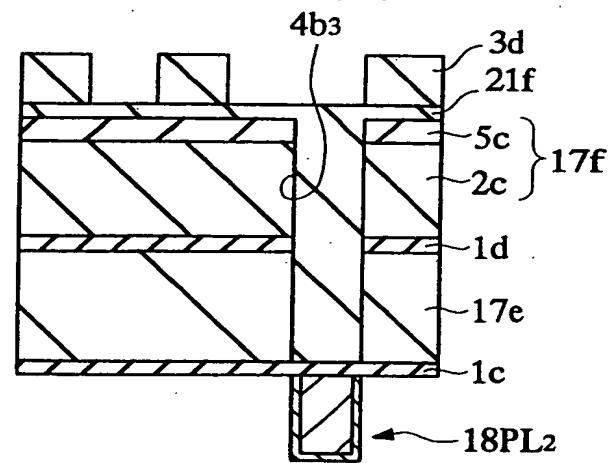


FIG. 75(a)

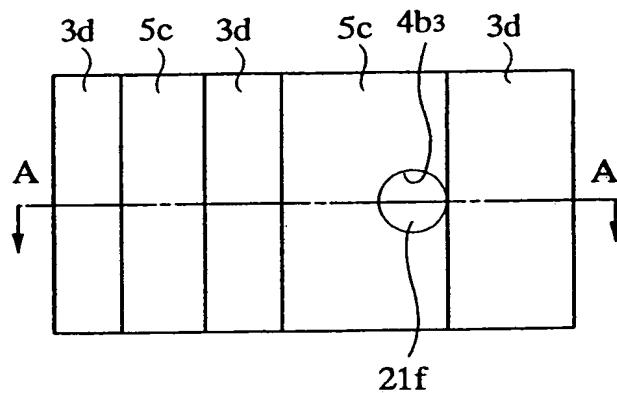


FIG. 75(b)

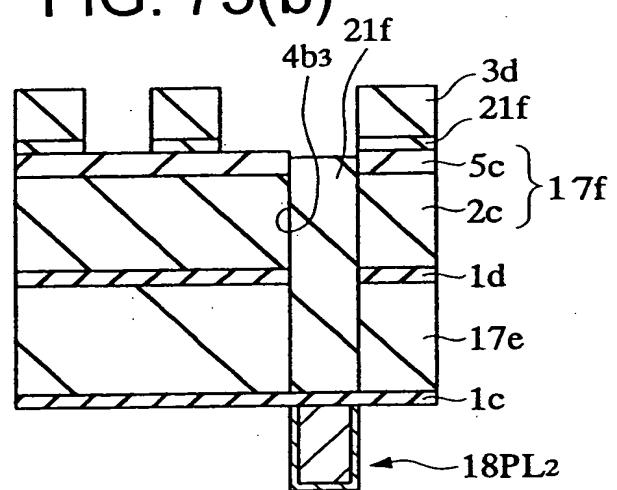


FIG. 76(a)

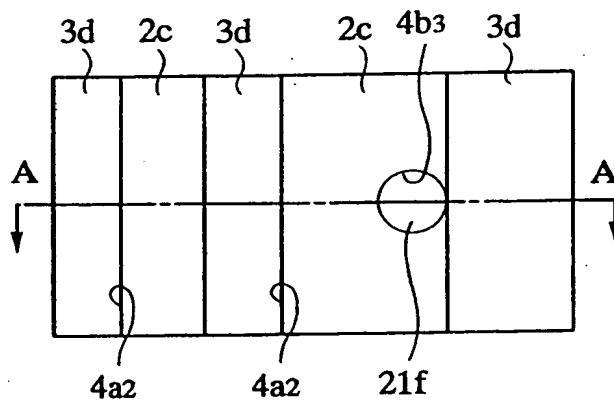


FIG. 76(b)

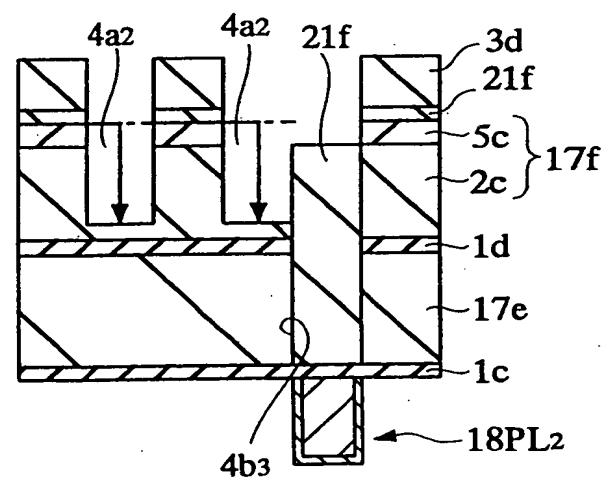


FIG. 77(a)

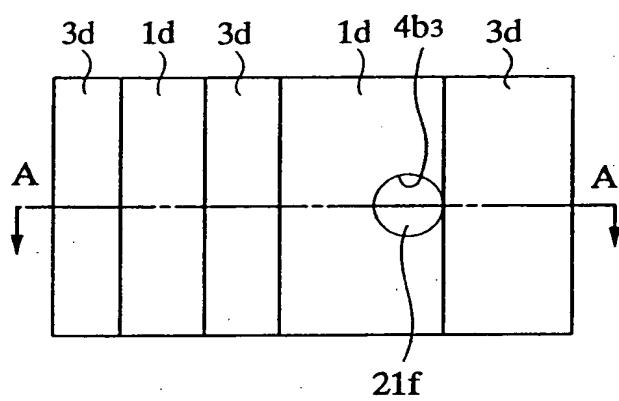


FIG. 77(b)

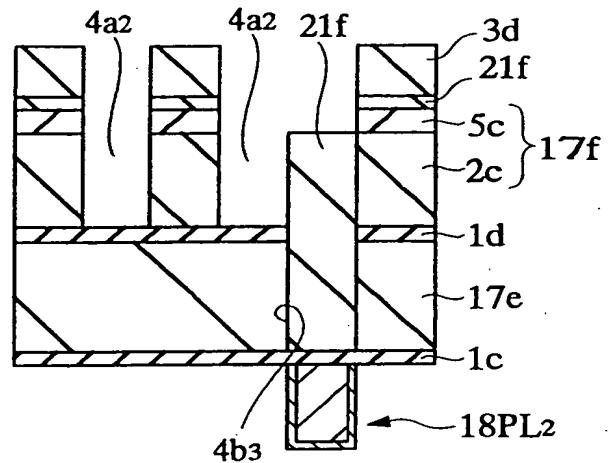


FIG. 78(a)

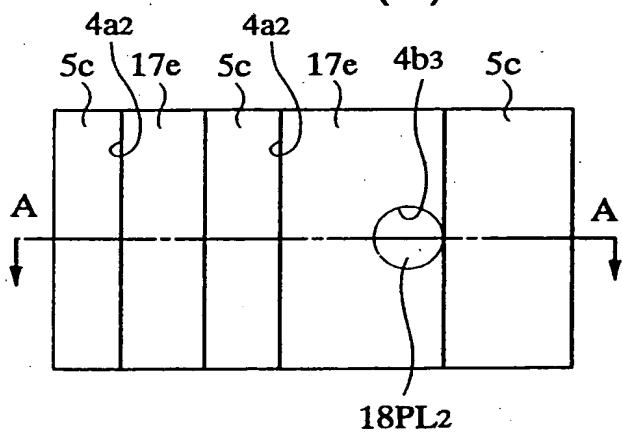


FIG. 78(b)

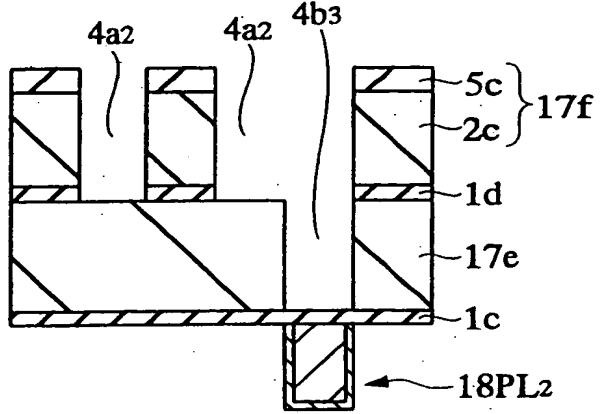


FIG. 79(a)

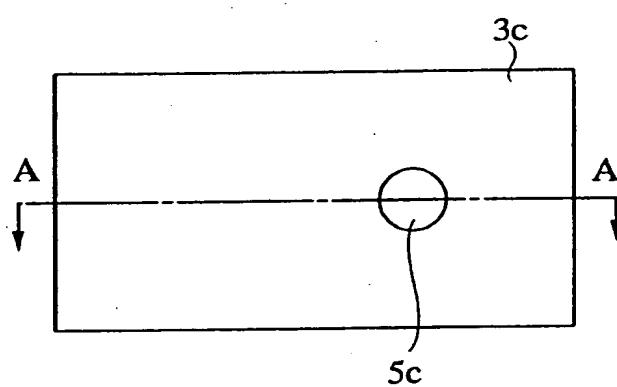


FIG. 79(b)

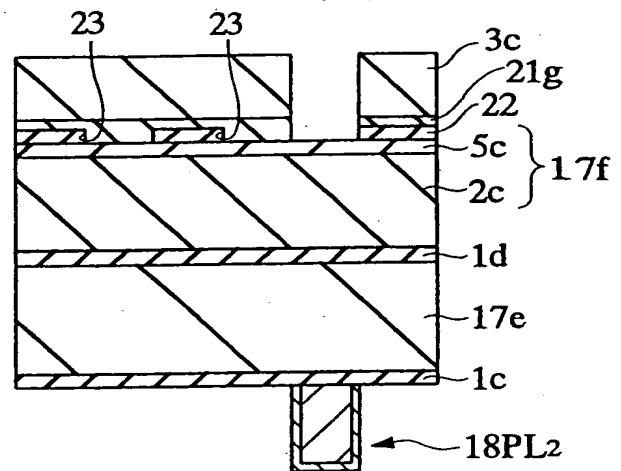


FIG. 80(a)

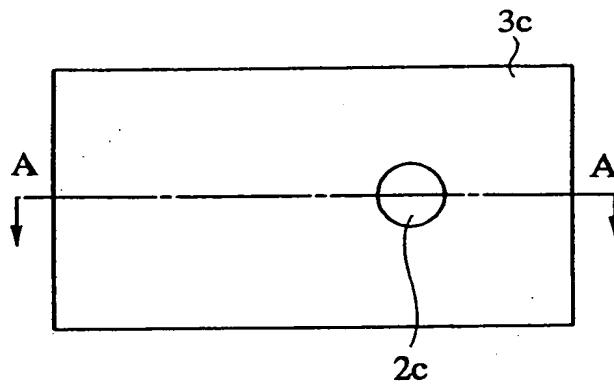


FIG. 80(b)

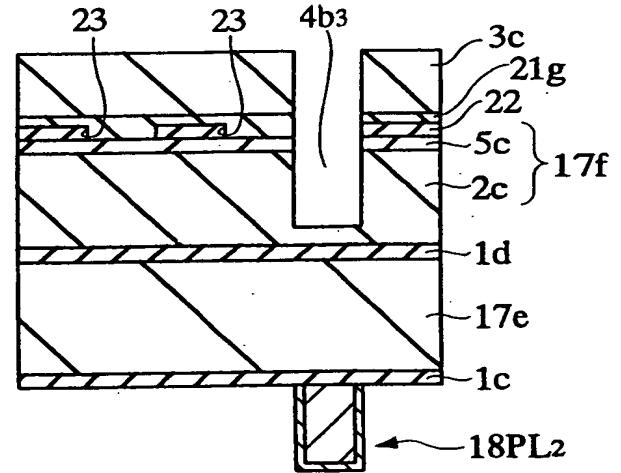


FIG. 81(a)

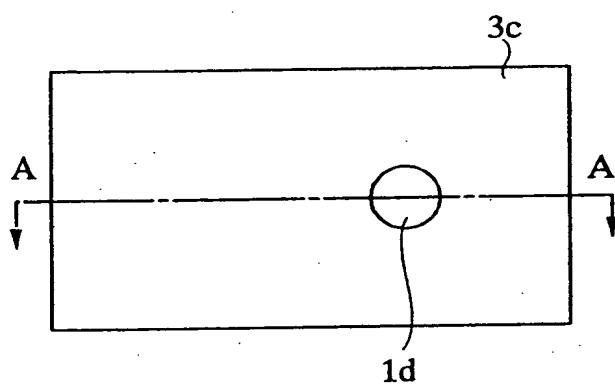


FIG. 81(b)

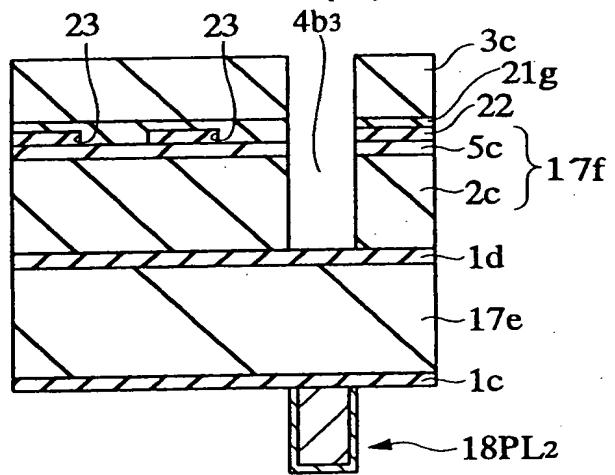


FIG. 82(a)

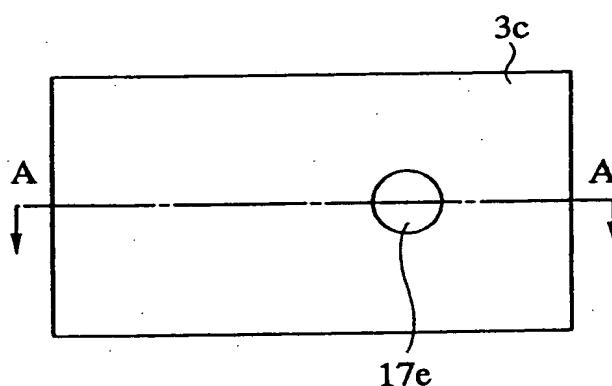


FIG. 82(b)

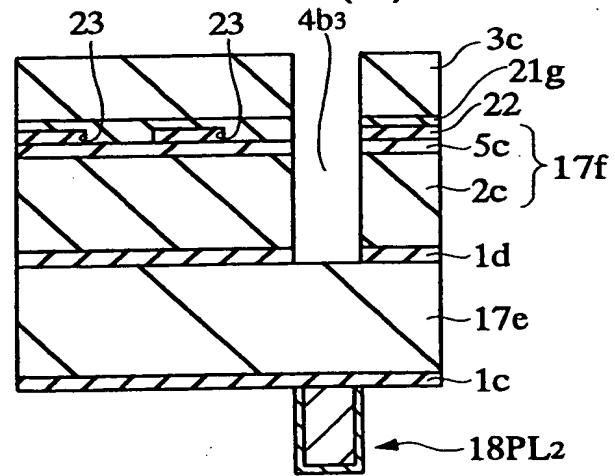


FIG. 83(a)

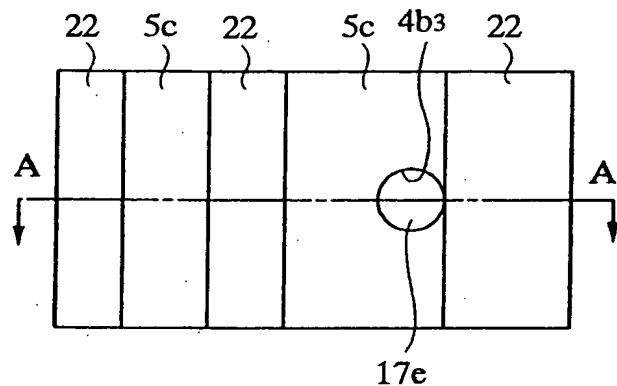


FIG. 83(b)

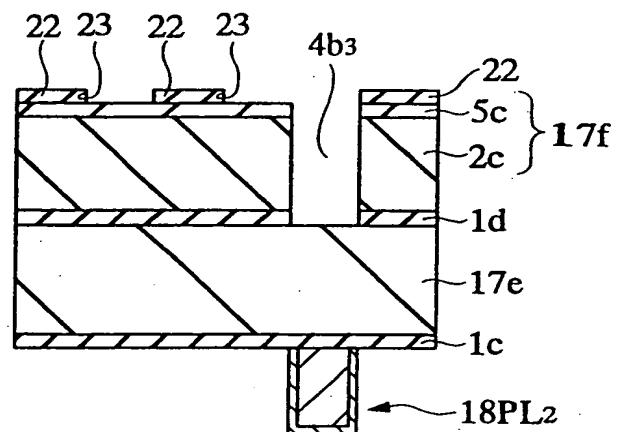


FIG. 84(a)

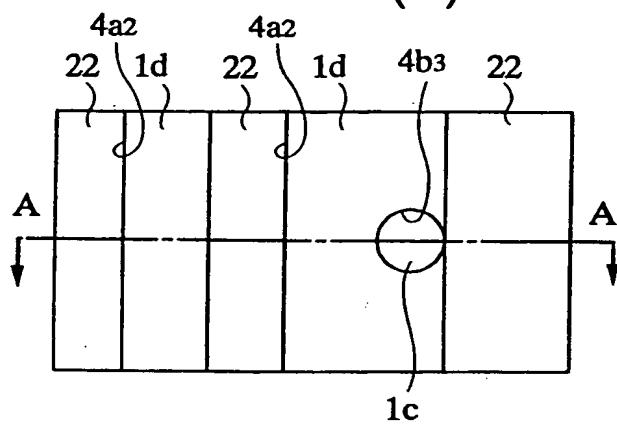


FIG. 84(b)

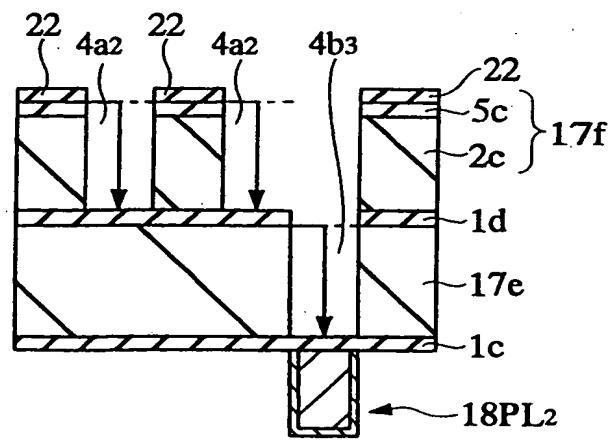


FIG. 85(a)

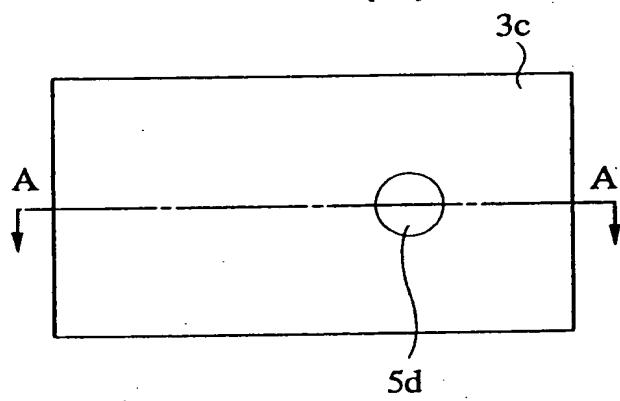


FIG. 85(b)

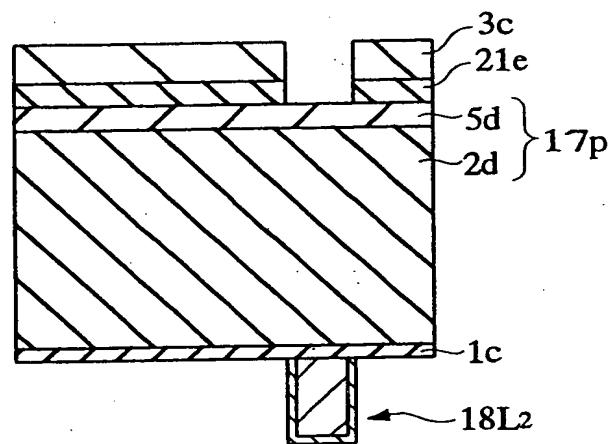


FIG. 86(a)

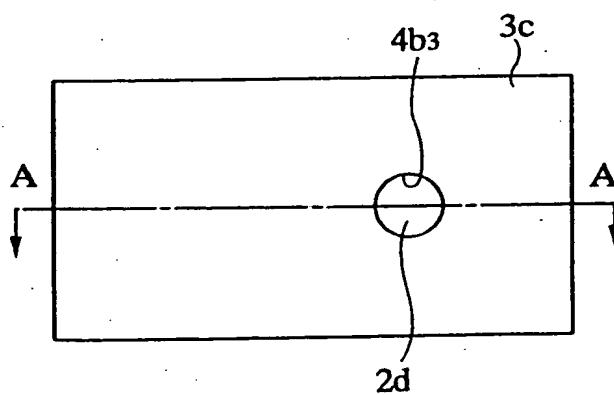


FIG. 86(b)

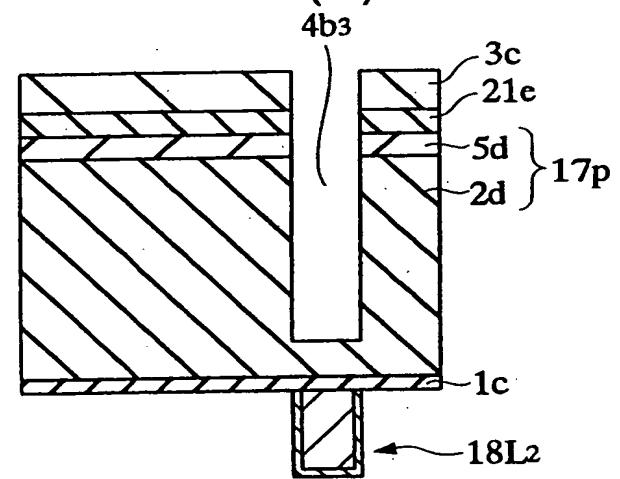


FIG. 87(a)

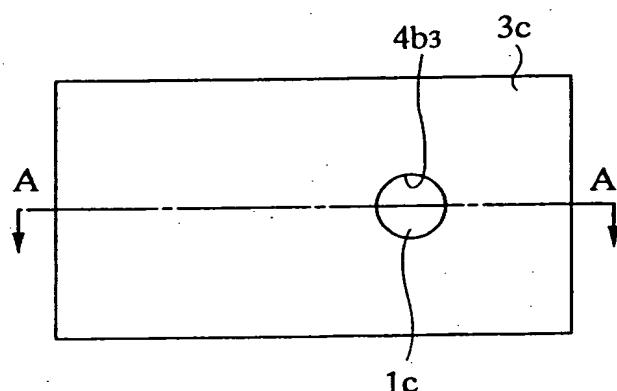


FIG. 87(b)

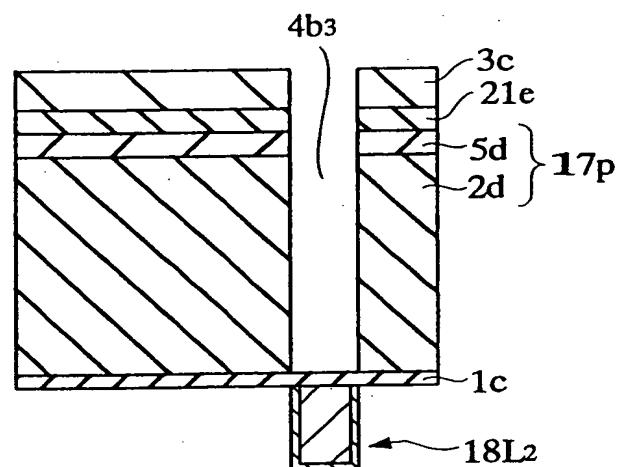


FIG. 88(a)

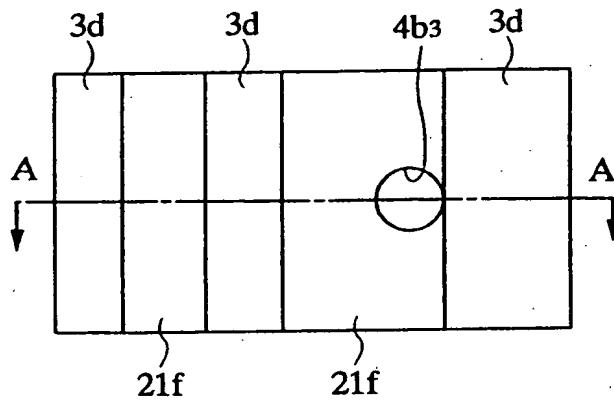


FIG. 88(b)

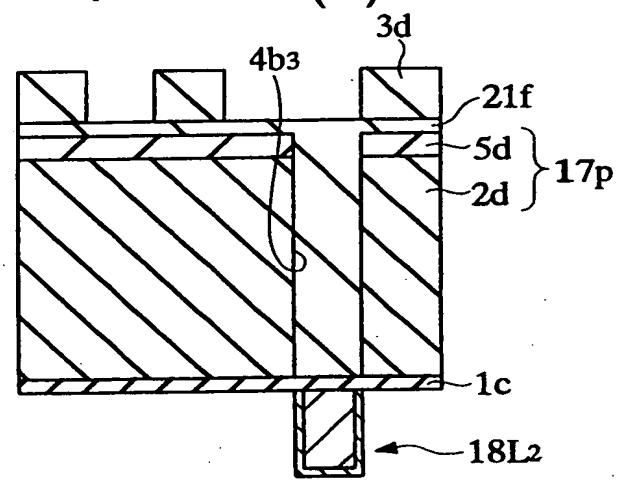


FIG. 89(a)

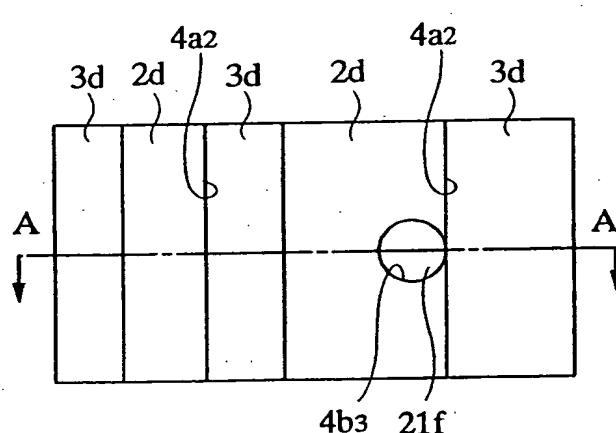


FIG. 89(b)

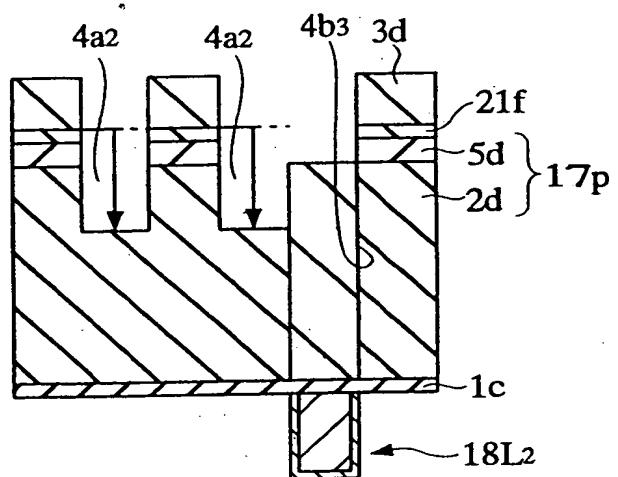


FIG. 90(a)

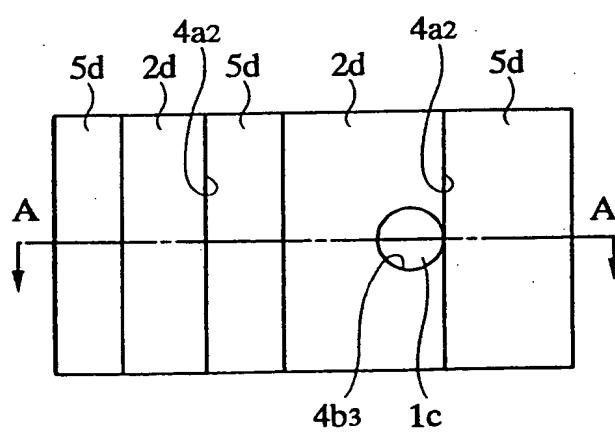


FIG. 90(b)

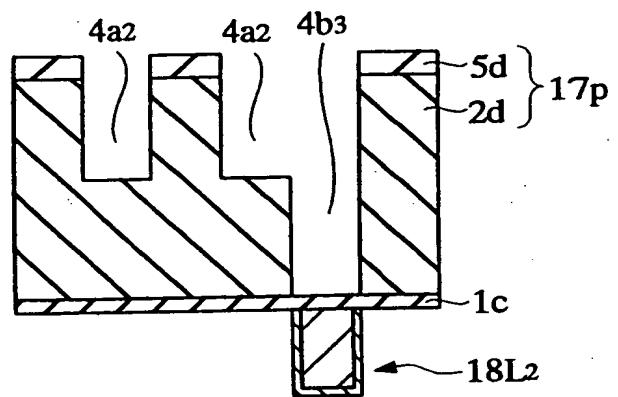


FIG. 91(a)

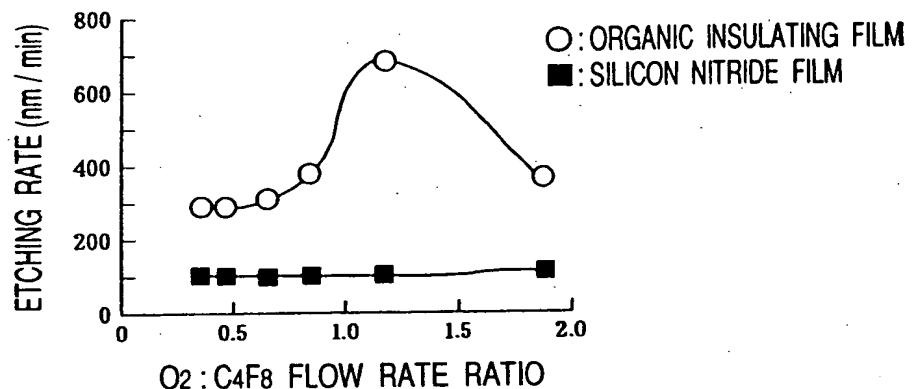


FIG. 91(b)

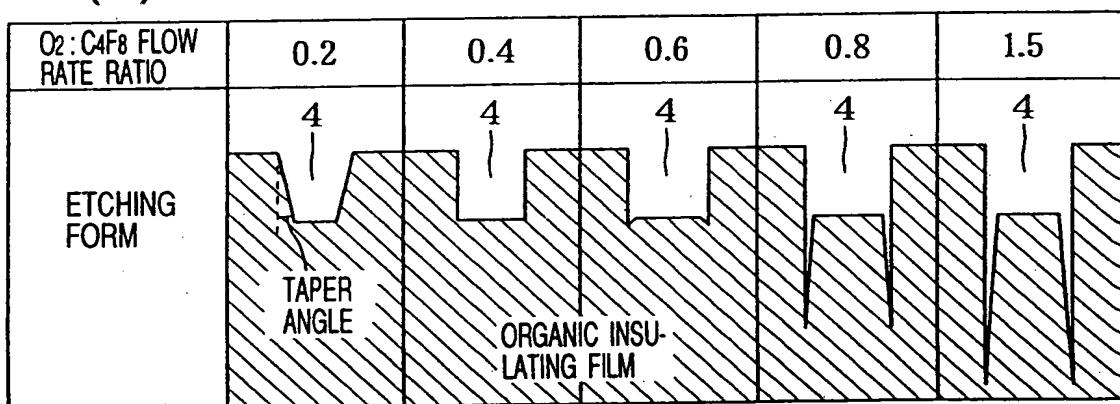


FIG. 91(c)

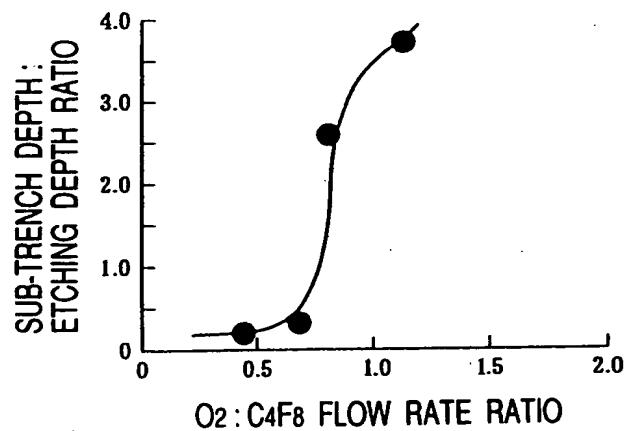


FIG. 92(a)

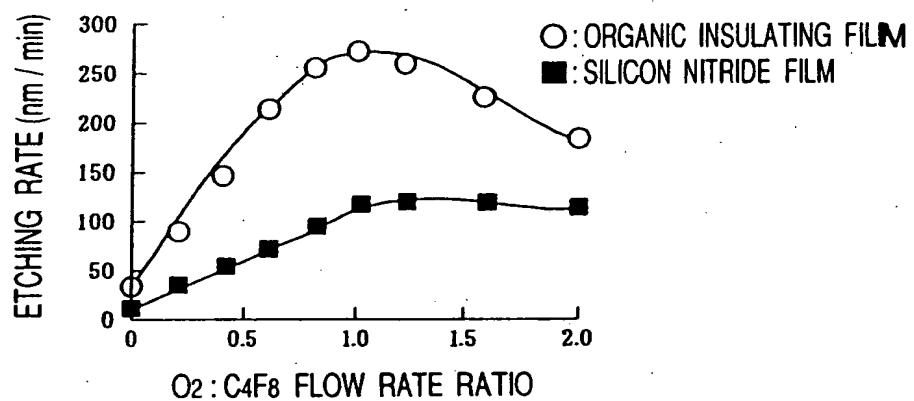


FIG. 92(b)

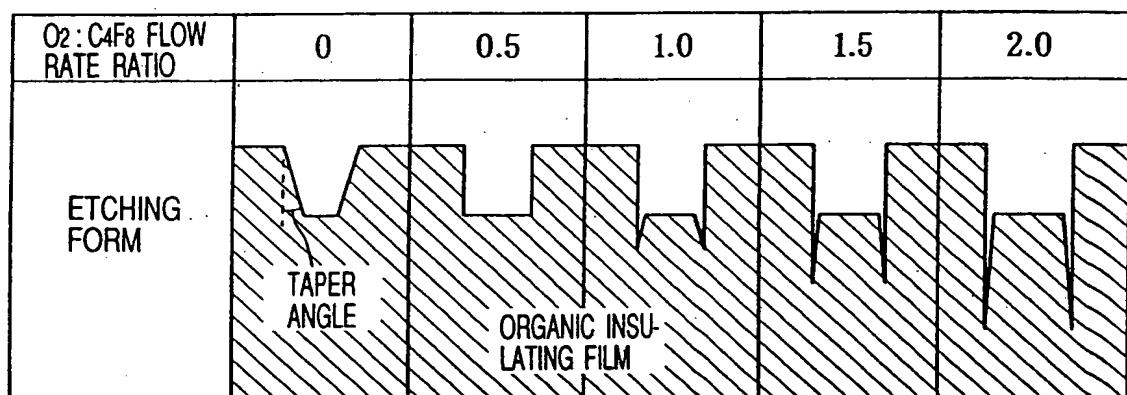


FIG. 92(c)

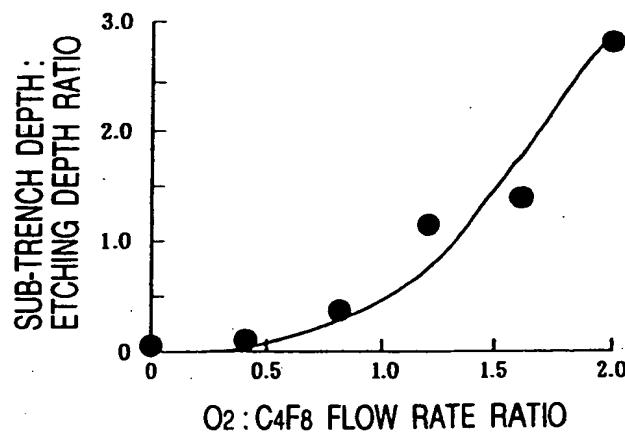


FIG. 93(a)

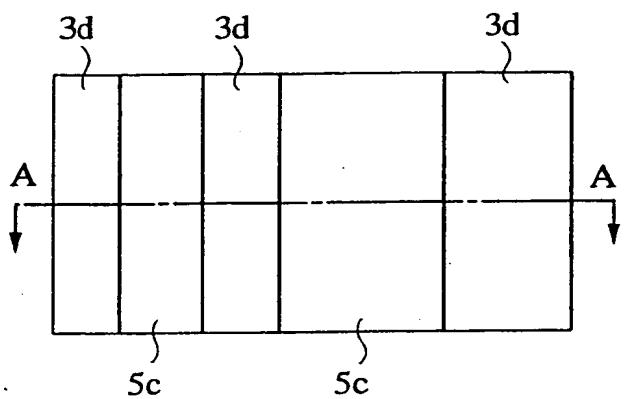


FIG. 93(b)

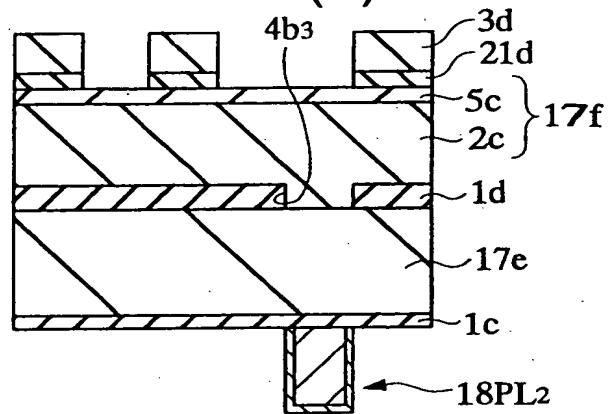


FIG. 94(a)

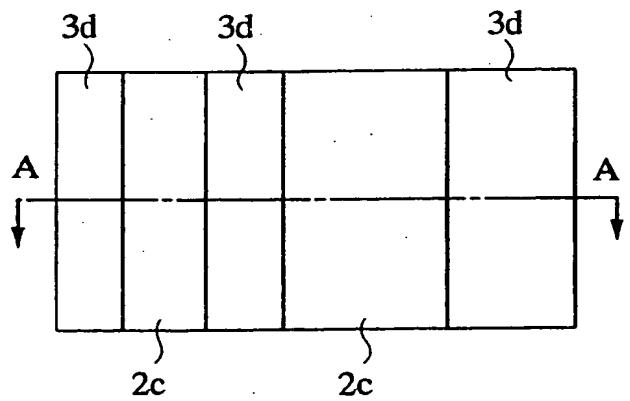


FIG. 94(b)

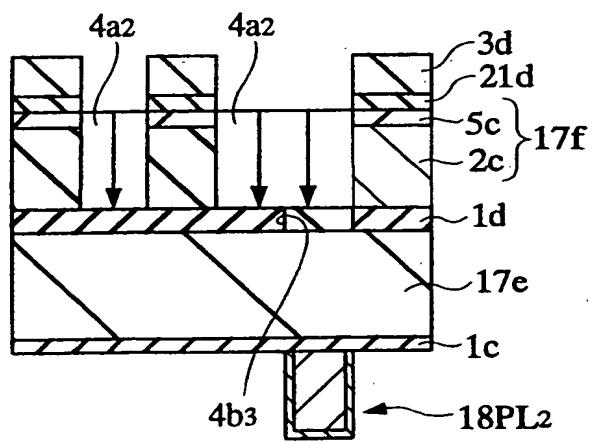


FIG. 95(a)

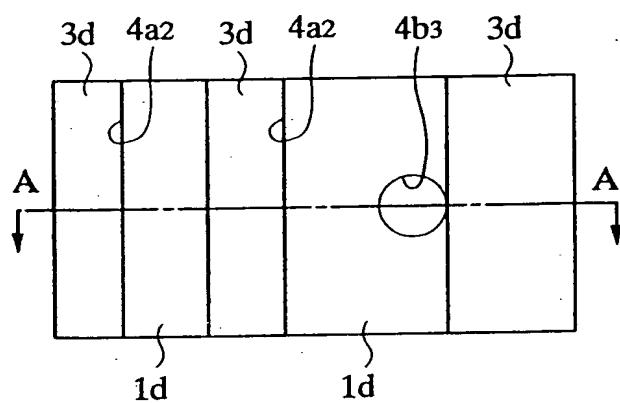


FIG. 95(b)

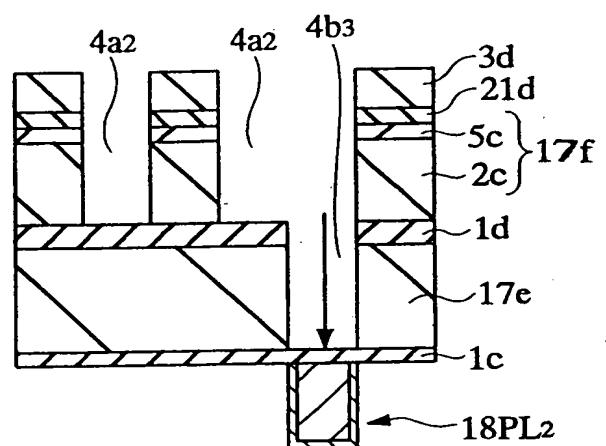


FIG. 96(a)

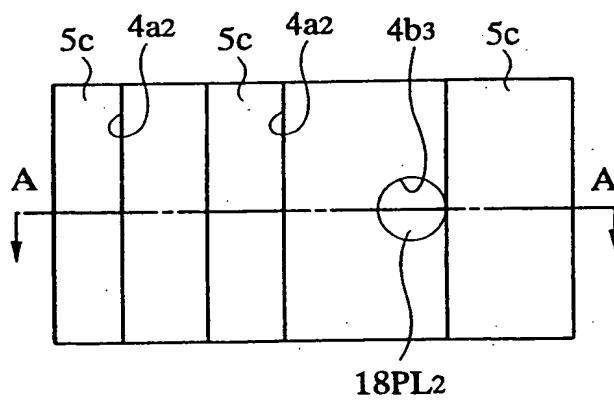


FIG. 96(b)

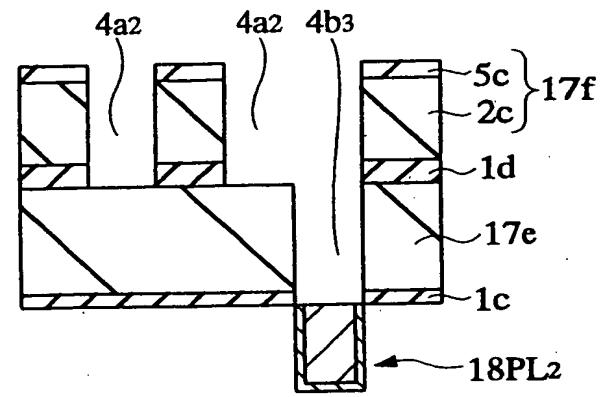


FIG. 97(a)

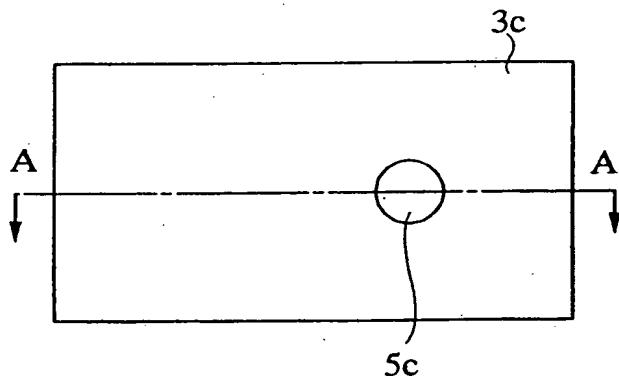


FIG. 97(b)

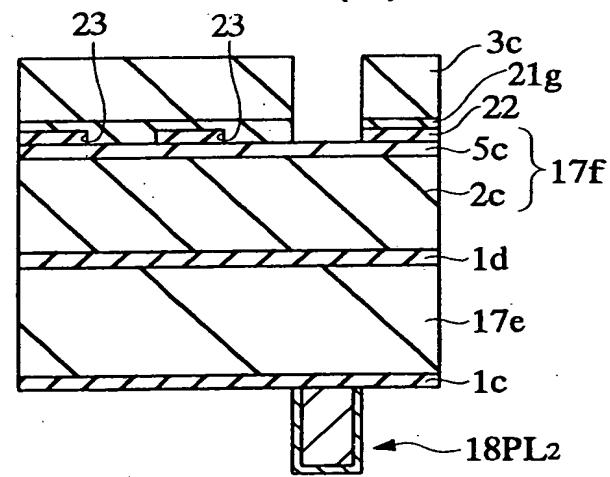


FIG. 98(a)

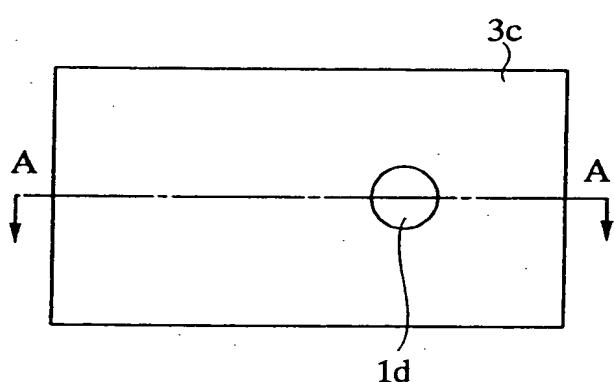


FIG. 98(b)

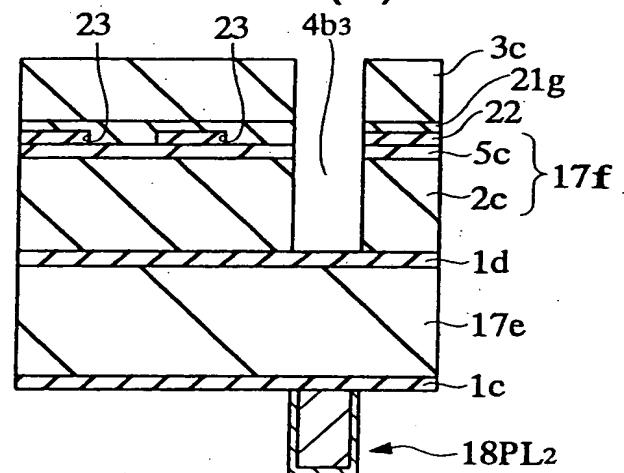


FIG. 99(a)

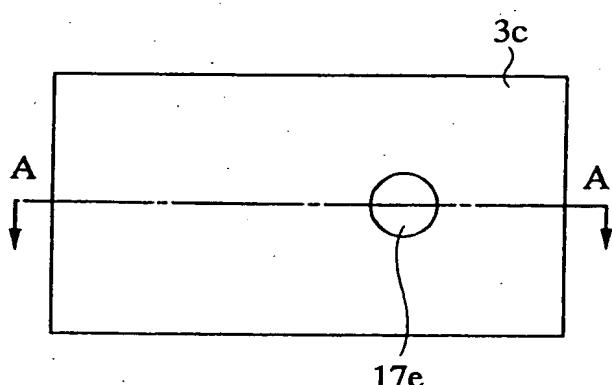


FIG. 99(b)

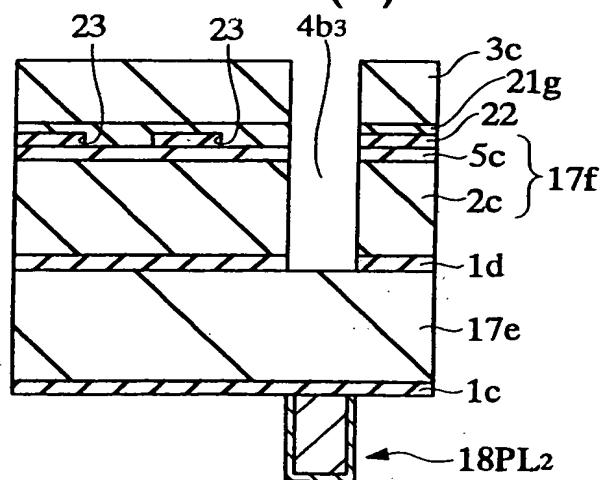


FIG. 100(a)

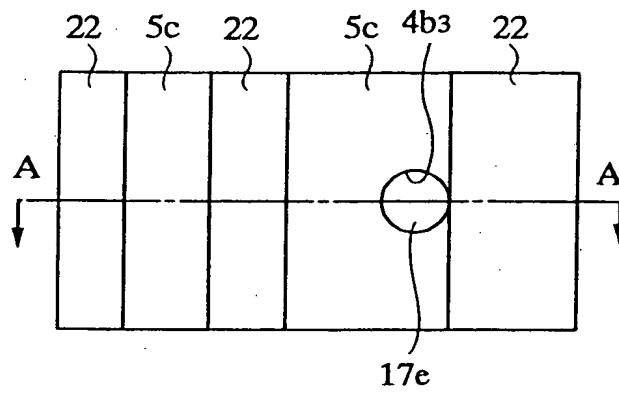


FIG. 100(b)

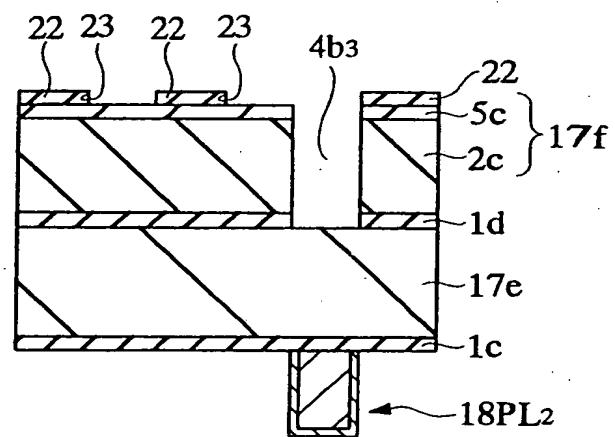


FIG. 101(a)

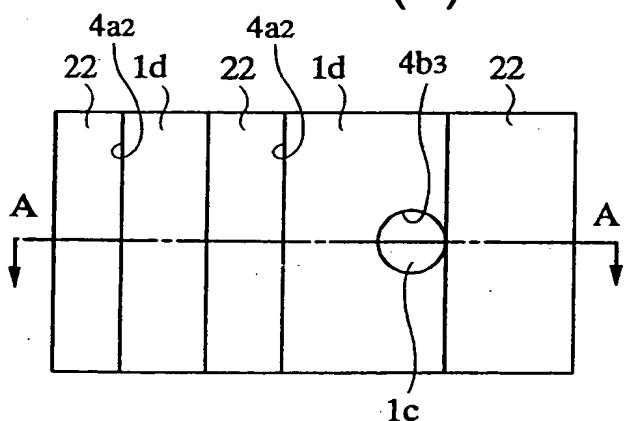
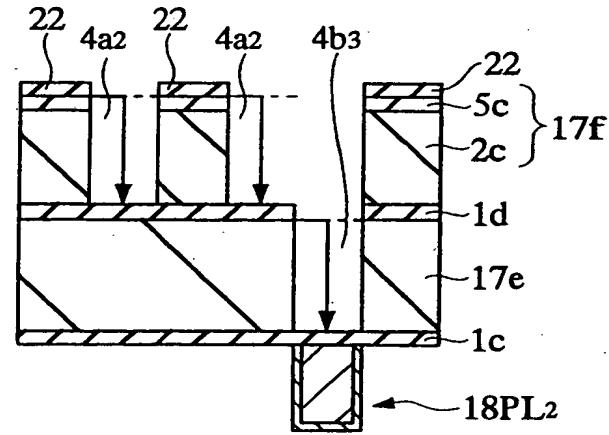


FIG. 101(b)



74 / 85

*FIG. 102*

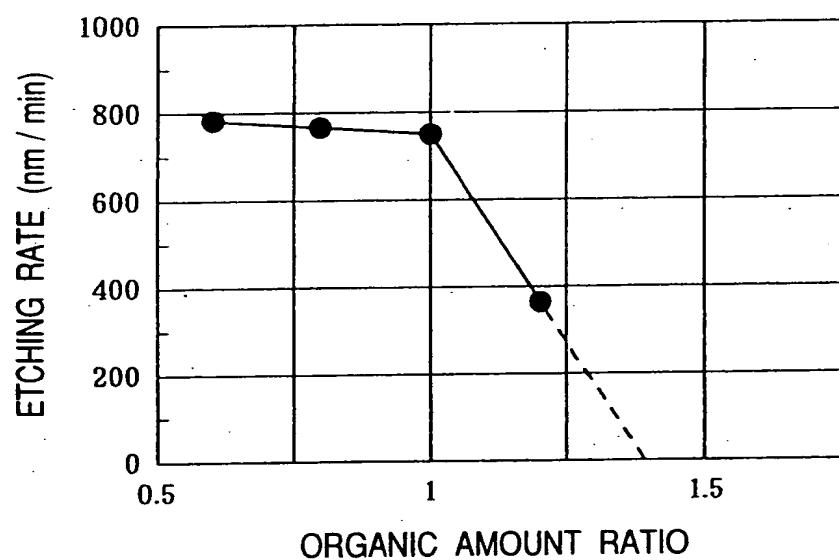


FIG. 103(a)

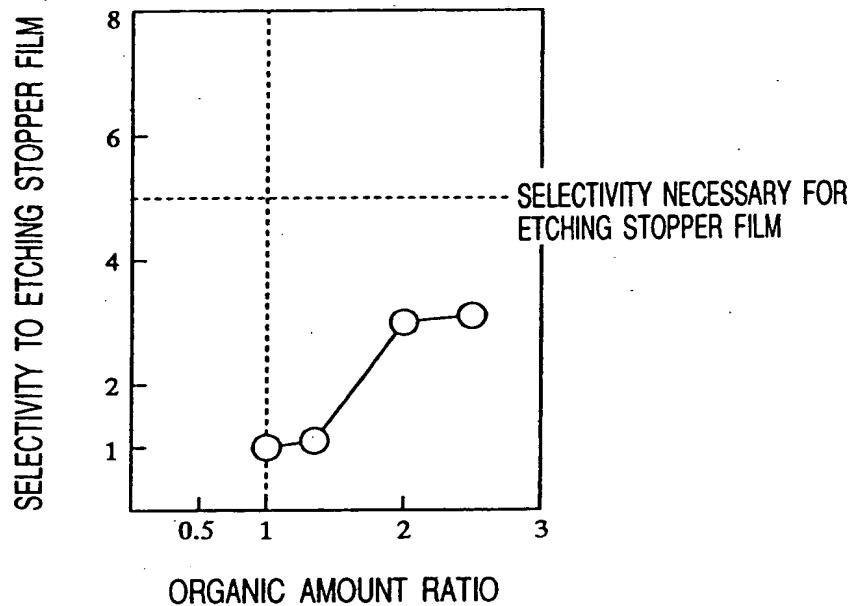


FIG. 103(b)

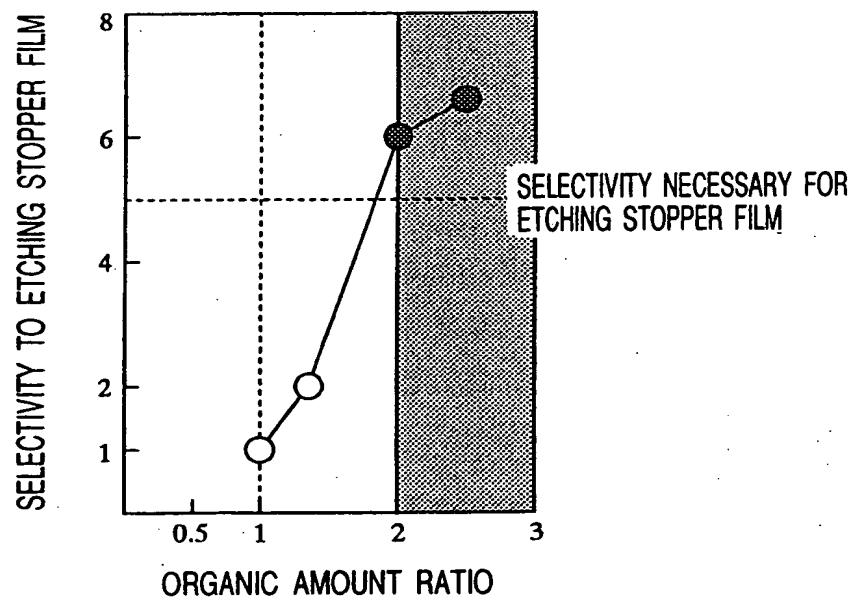


FIG. 104(a)

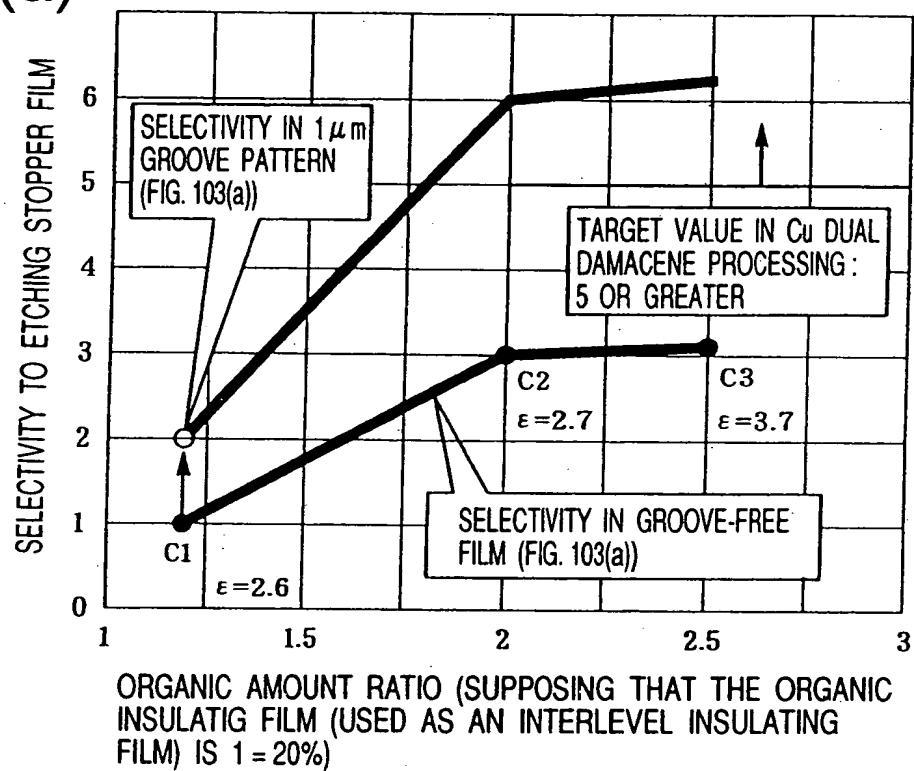


FIG. 104(b)

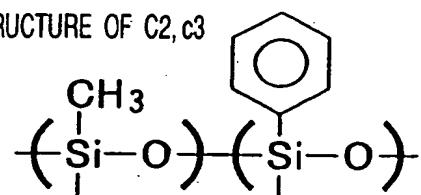
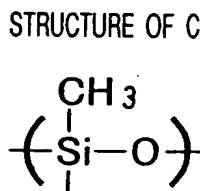


FIG. 105

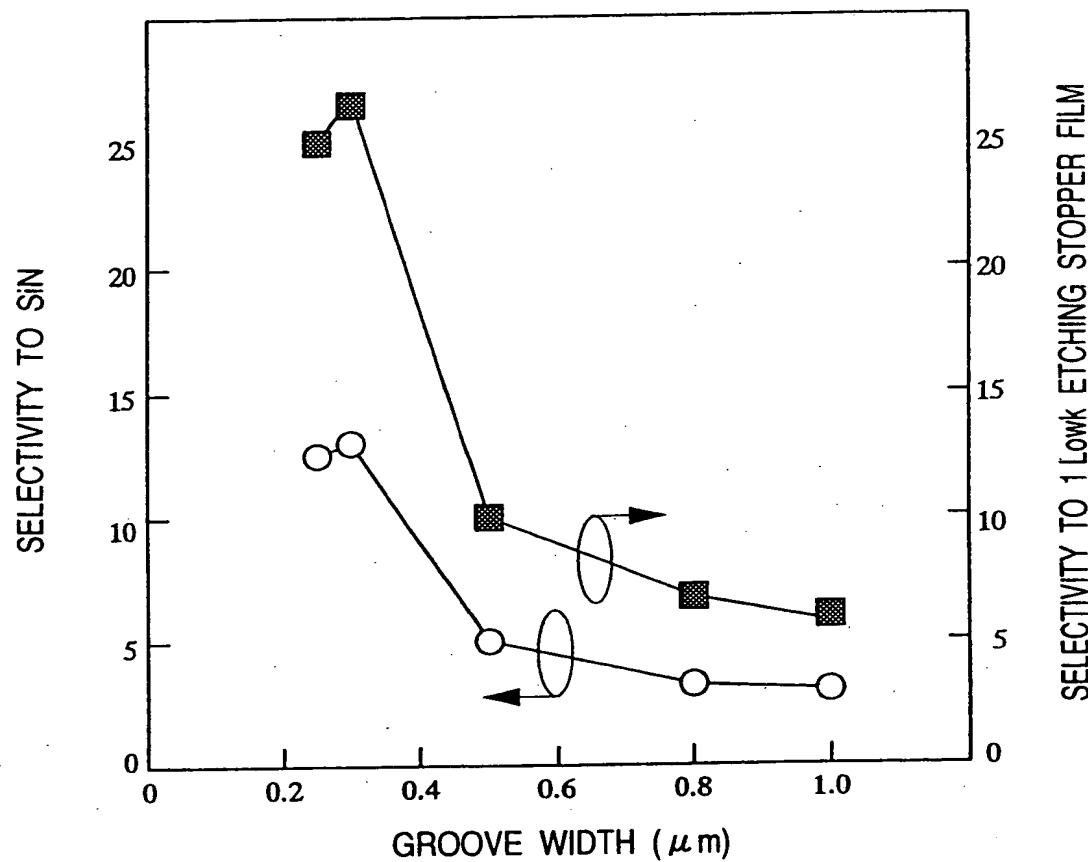


FIG. 106

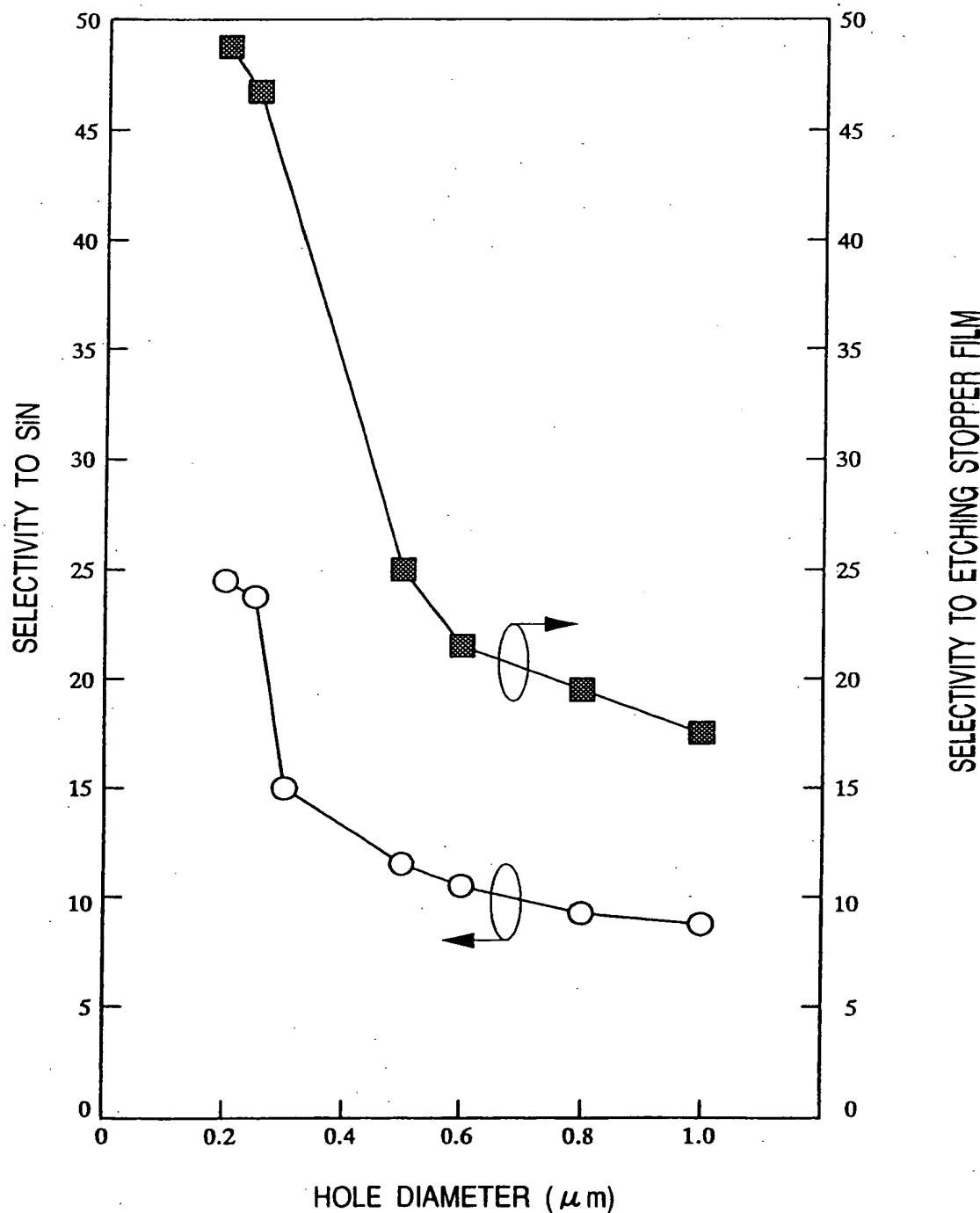


FIG. 107

	ADHESION ○	SELECTIVITY (TO ORGANIC SOG) 5~10	Cu DIFFUSION- PREVENTIVE LEAK PROPERTY ○	DIELECTRIC CONSTANT 7.0
PTEOS	○	2~3	×	4.2
Blok	△	5~10	△	5.0
NOVEL ETCHING STOPPER FILM	○	5~10	△	2.5~4.0

FIG. 108(a)

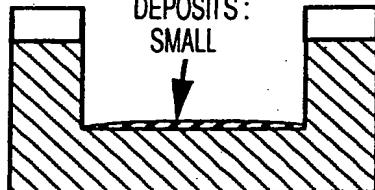
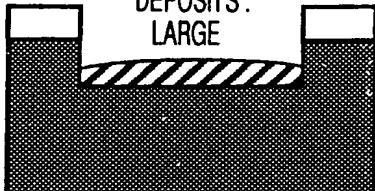
ORGANIC AMOUNT	CF CONSUMPTION RATE*	AMOUNT OF CF DEPOSITS	ETCHING RATE
SMALL (LARGE SiO CONTENT)	HIGH	 DEPOSITS: SMALL	HIGH
LARGE (SMALL SiO CONTENT)	LOW	 DEPOSITS: LARGE	LOW

FIG. 108(b)

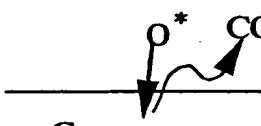
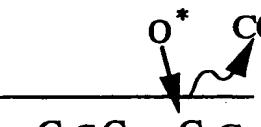
 C C C SMALL ORGANIC AMOUNT	HIGH ETCHING RATE
 C C C C C C LARGE ORGANIC AMOUNT	LOW ETCHING RATE

FIG. 109

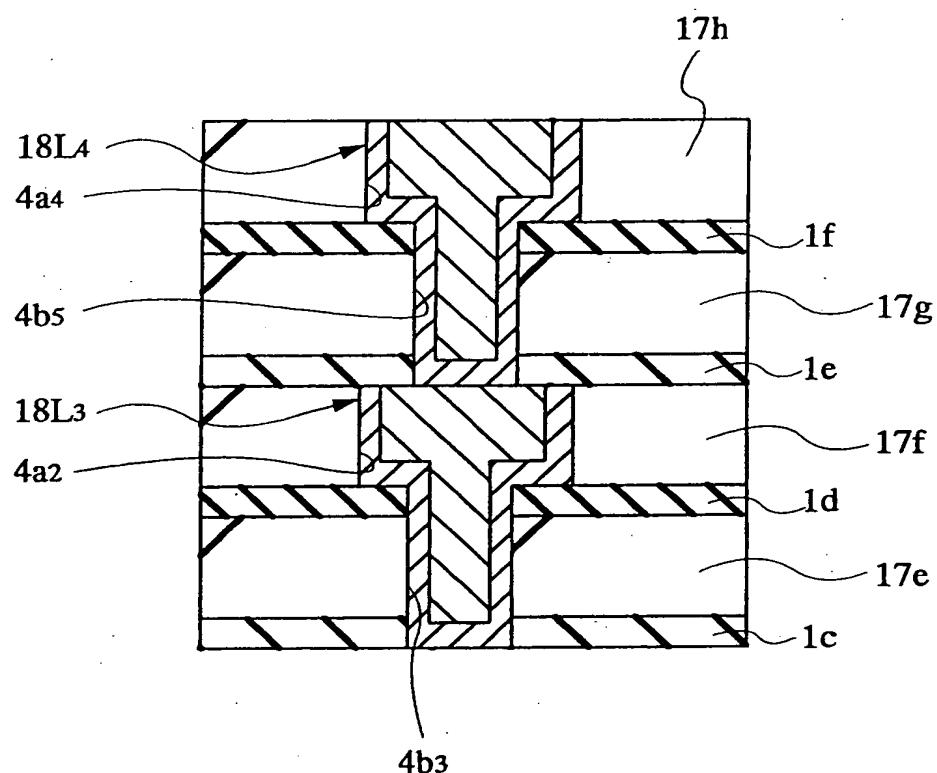


FIG. 110

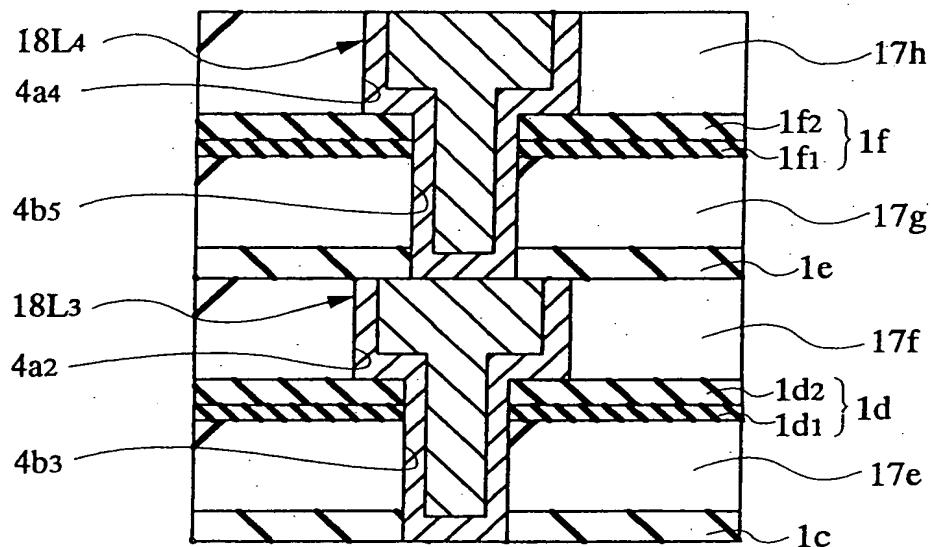


FIG. 111

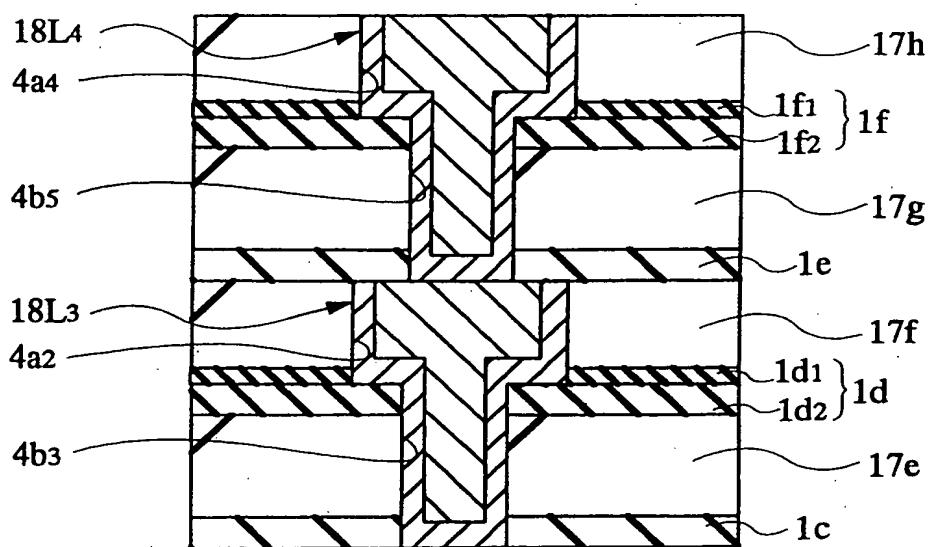


FIG. 112(a)

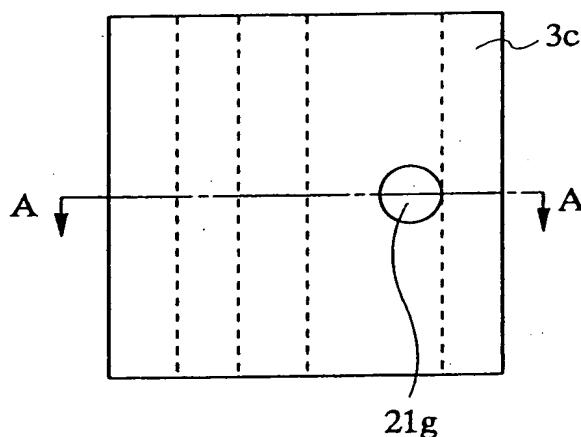


FIG. 112(b)

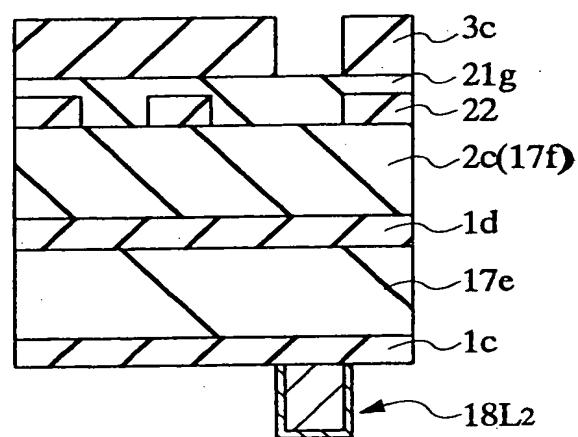


FIG. 113(a)

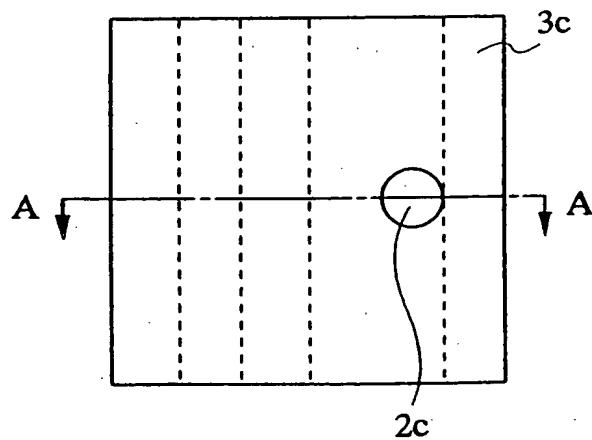


FIG. 113(b)

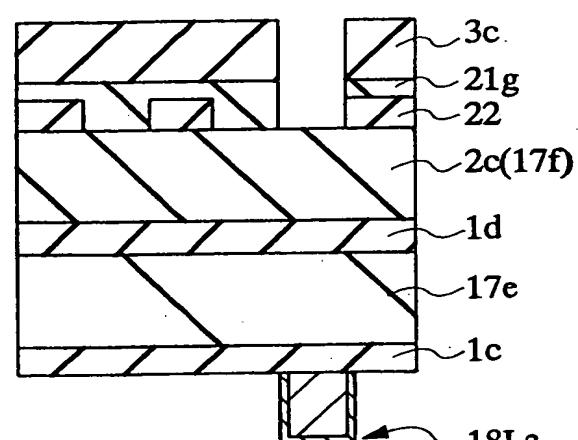


FIG. 114(a)

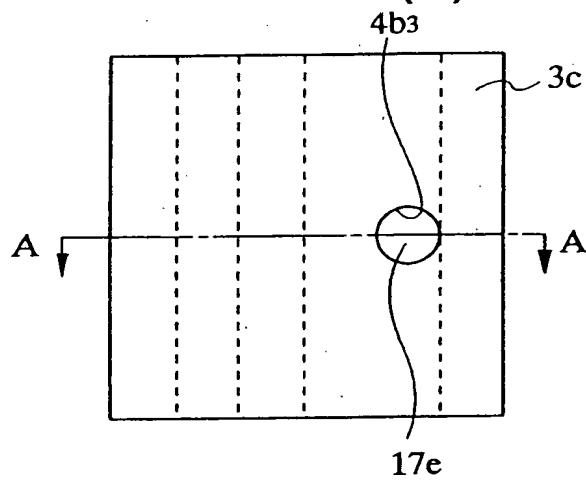


FIG. 114(b)

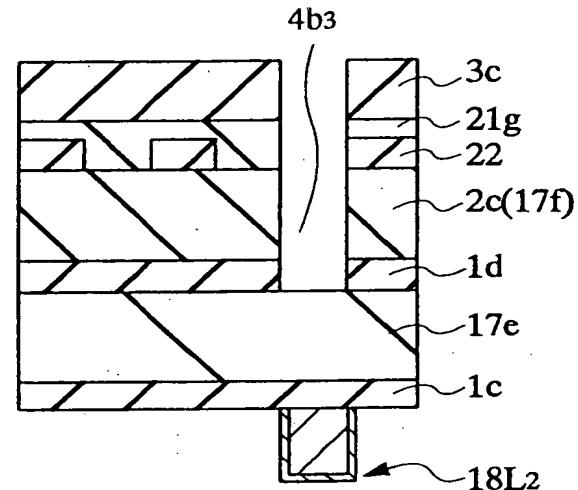


FIG. 115(a)

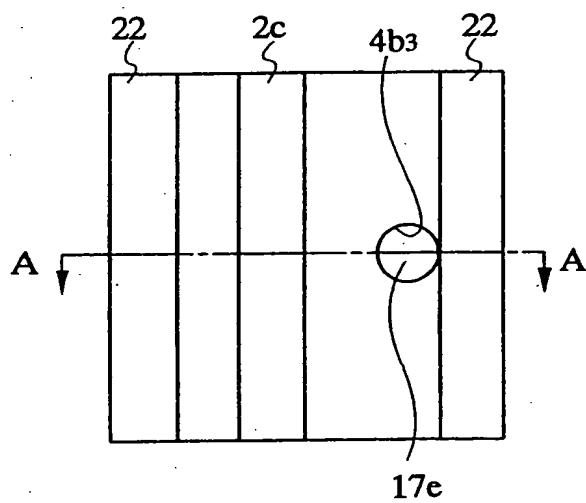


FIG. 115(b)

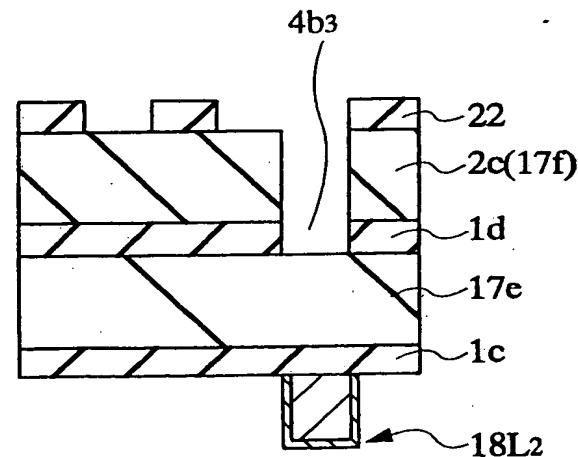


FIG. 116(a)

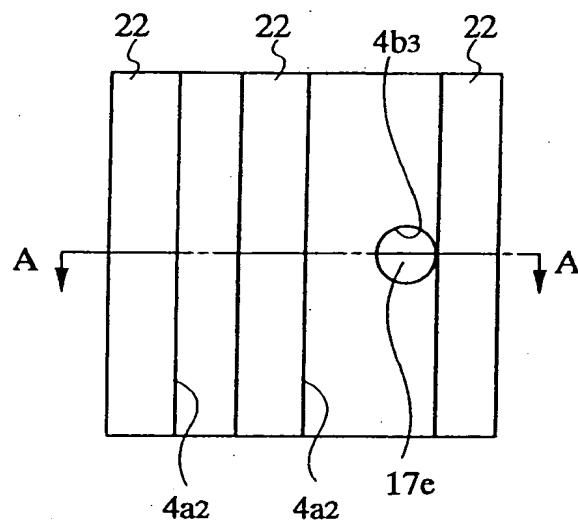


FIG. 116(b)

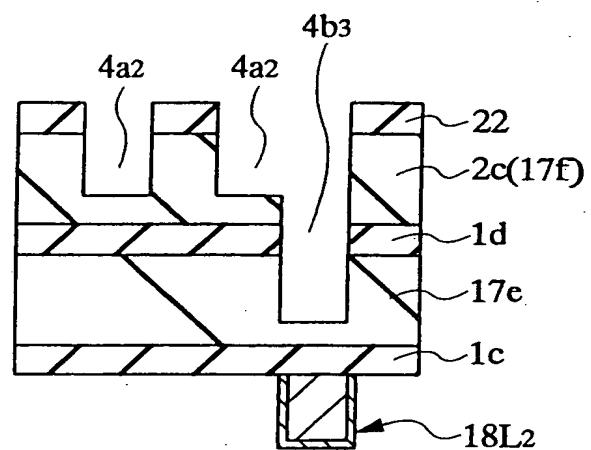


FIG. 117(a)

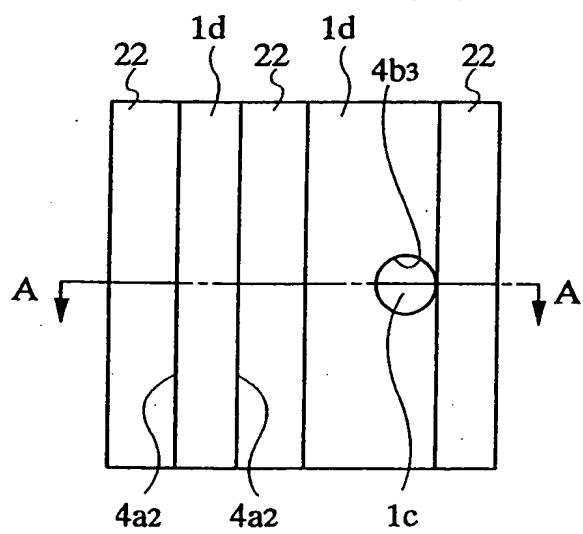


FIG. 117(b)

